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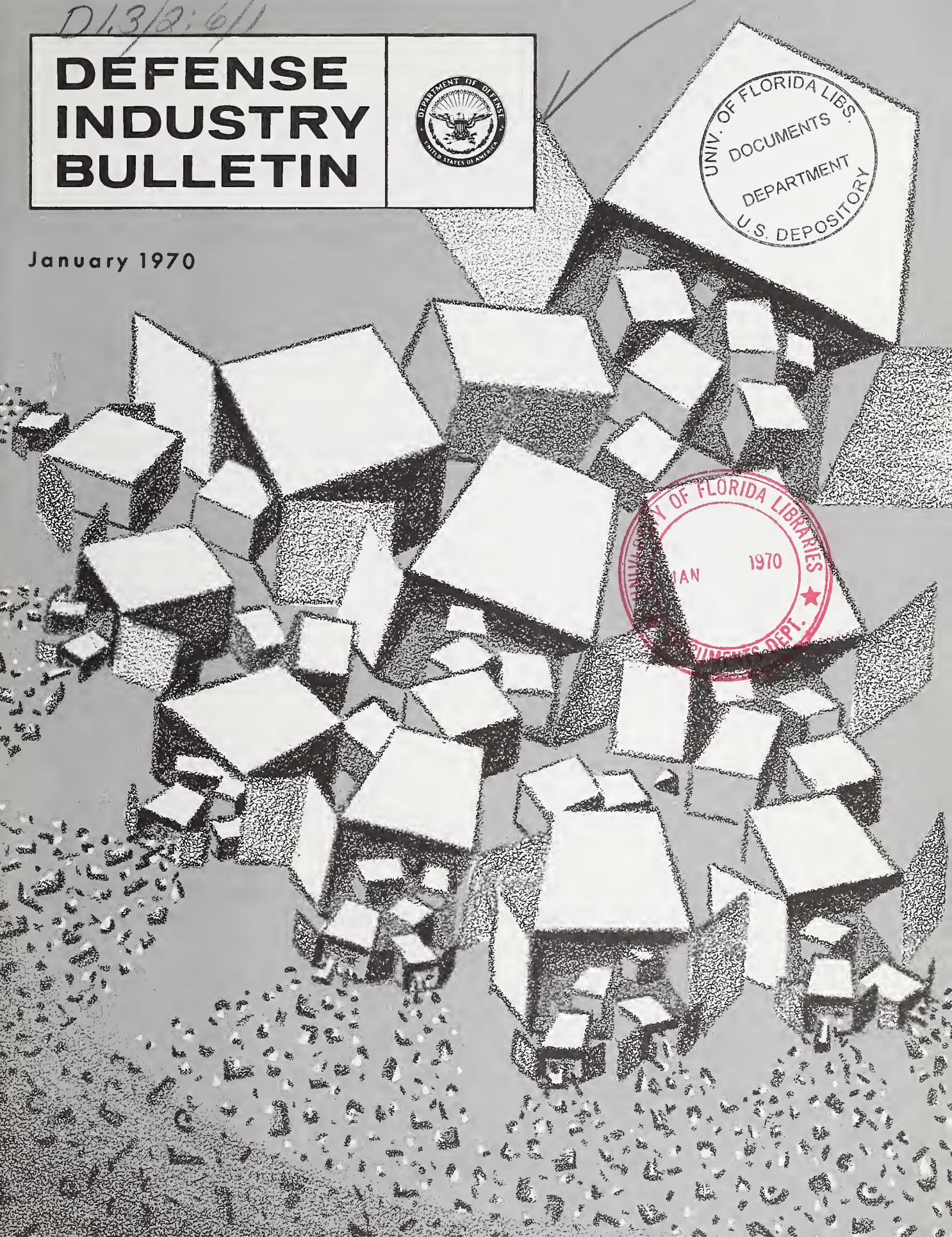

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Suggestions from industry representatives concerning possible topics for future issues are welcome and should be forwarded to the Editor at the address shown below.

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A major weapon system is comprised of hundreds of subsystems, tens of thousands of parts, and hundreds of thousands of connections and lesser components. Management of major weapon systems acquisition is discussed in article beginning on page 1.

Management of Major Weapon System Acquisition

Honorable Barry J. Shillito

In today's environment, much criticism has been levied against the Defense Department. A sizeable portion of such criticism has been directed at the way in which DOD has in the past managed the acquisition of major weapon systems.

My purpose in this article is neither to defend nor to condemn such criticism, but rather to raise the general level of understanding of the nature of the management problems involved in bringing into our operational inventory a major weapon system for our national defense. Additionally, I shall describe some of the changes in our methods and procedures, which our extensive review of this process have shown to be necessary, if we are to effect the improvements all of us desire.

At the outset it is important to recognize that in dealing with these complicated weapon systems of the future requiring such substantial outlays of public funds, we are faced with the problem of managing the weapon system acquisition process in an environment that is constantly changing. With change comes risks of varying size and composition which management must face. How DOD management deals with these categories of risks becomes a central issue in understanding the major weapon system acquisition process.

First, let me identify and briefly discuss the nature of these risks which we expect to some degree in every weapon system, and to a larger degree in every major weapon system.

Management Risks

The first category of risks involves the time it takes to acquire a weapon system.

A major weapon system acquisition has a time span of five to seven years, and sometimes longer. It is comprised of hundreds of subsystems, tens of thousands of parts, and hundreds of thousands of connections and lesser components. The interfaces and linkages on which the system's successful performance depends can run into the millions. Dealing as we are so far in the future, DOD managers must effectively deal with the risks of making cost projections over this time span, and stand accountable for decisions made.

Another category of risks that must be successfully dealt with is caused by the fact that a major weapon system involves nearly every field of technology. Over the past few years, the technologies have had a growth rate unparalleled with any similar prior time period. In any single weapon system, a significant number of these expanding technologies are often interdependently tied together. In looking downstream, DOD managers must resolve the nature and amount of forecasted growth in an array of technologies that can, optimally, be counted on for inclusion in a major weapon system to be operational so far in the future. There are substantial risks in doing this.

The ever-changing levels of capa-

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bility of our current or potential adversaries present another form of risk that must be effectively dealt with. The weapon system must also be designed to meet a forecasted threat derived from such variables as support of our international commitments, obsolescence of our current weapon systems, an unsolvable strategic or tactical problem, changing threats, greater weapon systems effectiveness, or a combination of any or all of these. In undertaking the development and production of a major weapon system, our management process must be responsive to the needs of effectively resolving the risks presented by this facet of this dynamic environment.

Another category of risk that our weapon system acquisition management must face is that, in developing and producing a weapon system that has not existed before, provision must be made for the proper identification and timely resolution of the many uncertainties our past experience tells us attend such an effort—the "unknowns" as one study described them. Even more important, when these foreseeable uncertainties, in turn, surface unforeseeable "unknowns," our management process must be able to prevent or minimize degradation to cost, schedule, or performance of the weapon system that has occurred in the past.

Finally, the contracting effort in support of the weapon system acquisition process must provide the degree of flexibility necessary to deal effectively with the kinds of risks peculiar to the weapon system in question. The contracting process must be responsive to the range of risks, balancing the opportunities for economic gain to the contractor with quality and timeliness of his performance in developing or producing the weapon system.

Development Concept Paper

As mentioned before, a major weapon system acquisition program involves the expenditure of very large amounts of public funds over a five-to-seven year period. It is important to provide a means by which the Secretary of Defense and his principal advisors can make a comprehensive review and decision on a major program, before heavy financial resources are committed to its development. The continuously improving

management process which provides such a mechanism is the Development Concept Paper (DCP).

The officer who has the primary responsibility for DCPs in DOD is the Director of Defense Research and Engineering. It is his responsibility to ensure the initiation of a DCP at the appropriate time in the life cycle of an important system. Important systems are those which are anticipated to require at least $25 million of research, development, test and evaluation funds or $100 million of production funds, or both; are high priority or are otherwise important, *e.g.*, because of unusual organizational complexity or technological advancement. The most common point at which DCPs have been introduced has been when a sponsoring Military Service is ready to go from concept formulation into contract definition.

The broad objectives of this management system are to improve decision making and implementation on important development programs by increased assurance that:

- Full military and economic consequences and risks of these programs are explored before they are initiated or continued.
- Information and recommendations on these programs are prepared collaboratively or coordinated with all interested parties, prior to review and decision by the Secretary of Defense.
- Premises and essential details of his decision on these programs are regularly recorded, and made known to all those responsible for their implementation.
- Opportunity for review is provided to the Secretary of Defense if any of the information or premises, on which his decision was based, change substantially.

The contents of a typical Development Concept Paper are:

Issues for Decison. Management issue or issues involved.

Program Purposes. Threat which the system is designed to meet or exceed; in short, the reason for the system.

Alternative Solutions. Are there different ways of meeting the threat on fulfilling the military mission?

Proposed Cost of the System. Expected effectiveness of the system in meeting the threat, and the planned schedule on which the system would be developed and put into production.

Pros and Cons. Is the system, in fact, needed? Would it be cheaper, for example, not to have such as system at all, but to take certain recognized losses that we might face in combat if we did not have this sytem?

Threshold Page. A most important part, because it is the gross management tool which the Secretary of Defense will use thereafter to ensure that the system is remaining on track throughout its life. In the case of an aircraft, the threshold sheet would contain figures on technical and operational performance, such as the maximum weight growth which would be allowed before the entire development program is reopened for review by the Office of the Secretary of Defense. Similarly, other thresholds, having to do with cost and with schedule, are established in this portion of the DCP. For example, if the estimated cost of a system in development is $100 million, a threshold of say $110 million might be established. Within these bounds, the sponsoring Military Service is fully responsible for the entire management of the program. If, however, a system runs over or threatens to run over the $110 million threshold figure, then the system is fully examined, not only by the sponsoring Service, but by the Office of the Secretary of Defense. A new DCP may be written, and a new decision may be made.

Management Plan. How does the Service plan to manage the program? What is the composition of the System Program Office?

Matter of Security. What has to be classified about the development? What can be unclassified? This is very important with respect to indus-

trial considerations.

Conditions for Revisions. As previously indicated, a DCP is supposed to be a living document which can be referred to throughout the life of the system and found to be accurate at any time. The DCP will normally be updated at the end of contract definition so that it contains more accurate figures on the system, its performance, its schedule, and its cost. Similarly, the DCP is updated at the time the production decision is made. This updated DCP is to ensure that we go forward into production with a valid and current understanding of the major features of and surrounding the system, including the threat which it is intended to meet, the performance parameters, and the cost and schedule features.

Decison Options or Alternatives. The Secretary of Defense is presented various alternatives from which he may choose, such as to allow the candidate system to go into contract definition. Another alternative might be not to go ahead with contract definition, but either to perform further advanced development or simply not to develop this system in favor of developing another one, or making another do to meet the mission requirement.

Signatures. A DCP contains the signatures of the Director of Defense Research and Engineering, the sponsoring Service Secretary, certain Assistant Secretaries of Defense (such as Installations and Logistics, Comptroller, Systems Analysis), and then the signature of the Secretary of Defense or the Deputy Secretary indicating his decision.

Defense Systems Acquisition Review Council

As a means of providing management overview for timely decision making, Secretary of Defense Laird has established the Defense Systems Acquisition Review Council. The mission of the council is to review major and important weapon system acquisition programs at appropriate milestone points in their life cycle. These reviews are to permit coordinated evaluation and deliberation among senior managers, to assure that the advice given the Secretary of Defense is as complete and objective as possible prior to a decision to proceed to the next step of the system's life cycle. The operation and evaluation of this council serves to complement the Development Concept Paper system.

The Defense System Acquisition Review Council is composed of the Director for Defense Research and Engineering and the Assistant Secretaries of Defense for Installations and Logistics, Systems Analysis, and Comptroller. While the council can meet as the need dictates, or at the request of an individual Service, the council will generally review and evaluate the status of each appropriate program at three basic milestone points:

When initiation of contract definition (or equivalent effort) is proposed.

When transition from contract definition to full-scale development is proposed.

When transition from the development phase into production for Service deployment is proposed.

The council is chaired by the Director of Defense Research and Engineering for consideration of entry into contract definition, and for entry into full-scale development. For the transition from development to production, chairmanship of the council shifts to the Assistant Secretary of Defense (Installations and Logistics). For additional reviews, the council will be chaired by either of these two officials, as appropriate. Thus, it can be seen that before a major system can move to the next important step in its life cycle, it must pass the scrutiny of senior DOD managers. They determine that satisfactory progress has been made and is expected to continue, in accordance with the finite original and updated plans for accomplishing the acquisition of the system. The council is then in a position to make recommendations for decision to the Secretary of Defense or the Deputy Secretary of Defense.

Continuing Study of Acquisition Process

As mentioned at the outset, we have been subjecting the entire weapon system acquisition process to intensive study. There are areas which are subject to improvement. We are looking at them in order to determine how best to proceed.

One such area is the source selection process and decision making attendant to it. This involves the whole matter of concept formulation and contract definition:

How we narrow down to and, finally, select one contractor.

How and when we make the various decisions relative to development and readiness for production.

How we select the type of contracting which is best fitted to a particular program.

We are generally convinced that over the years management changes have been made basically in the right direction. Problems were identified in the mid- and late 1950s with respect to improving the disciplines of weapon system management. Since that period, there has been a continuum of improvements in this area. However, contracting methods, as well as concept formulation and contract definition policies and regulations, may have moved so far that we have deprived ourselves of appropriate flexibility to allow the most effective acquisition to take place.

There have been many criticisms in the past few years by industry that it has been forced by the Government, or by the prevailing environment, into making over-optimistic estimates of the cost and schedule of the development and production of a system, in order to allow themselves any real chance of winning the competition. DOD does not want industry to be over-optimistic. We want to be informed what industry considers to be an accurate appraisal of the development risks ahead in a program. The Government is prepared to pay a fair price for a system, provided we are assured that the system is needed and we can make an estimate ahead of time of what it is going to cost, so we can evaluate its military utility *versus* its cost. It is not the desire of DOD to put a contractor in a position where he must take an overly optimistic view of the risks ahead, in order to give himself any opportunity to be successful in the competition.

On the other hand, we must know what we may encounter in the way of costs and development problems. We feel we cannot shift to the other end of the scale, where we would do business completely on a cost-plus basis without regard to evaluation of the risks ahead. In this connection, we are

convinced at the present time that we would be well advised to attempt to do more design validation and more prototyping rather than to depend, as much as we have, on paper estimates and paper analyses of what risks lie ahead of us. Quite desirable, of course, would be to have competitive prototypes for every system or every component that we develop. This, as we all recognize, is not practical. It is far too expensive, for example, and too time consuming to build two complete competitive aircraft weapon systems, and to fly them one against the other to decide which one we want to buy.

It is feasible, however, to conduct prototype competitions of certain major subsystems, such as engines, avionics, radars, or even aircraft missile systems. Such competitions might logically be conducted with a prime contractor's subcontractors, depending upon the circumstances. We believe that we may have been making our decisions to produce too early in the life of a system. We may be well advised, in many cases, to attempt to carry competition farther along than we have, until we are assured that more of the risks involving unknowns are behind us—until we, indeed, have purely engineering ahead rather than experimental development, and until contractors can make more accurate estimates of what the remaining development and production of a system will entail. All these things are involved in the source selection and decision making. We are looking at them carefully, and expect to make changes indicated by our studies as soon as we have convinced ourselves that we are moving in the right direction.

Milestone Contracting Concept

We are presently attempting to structure into the weapon system contract, at the time of initial award, a discrete number of significant milestones which permit objective evaluation of the contractor's actual accomplishment, as against the planned accomplishment. Included in both the development phase and in the initial production phase, the attainment, or lack of attainment, of such milestones will give enhanced visibility to the technical progress of the program.

The milestones chosen will be meaningful and measurable points of technical accomplishment and useful alike to both contractor and government management, for the orderly direction of a program's progress. Further, by contractually tying successful accomplishment of milestones in the development contract to release of funds for long-lead time production items, as well as the exercise of production options, demonstration of technical accomplishment will ensure that the program commitment is increased at a pace that is commensurate with the reduction in program risks. Finally, by placing the development/production effort within a contracting envelope that properly recognizes the risk/reward balance, and under the stimulation of appropriate incentives, we aim to avoid many problems that have in the past occurred in acquiring major weapon systems, wherein commitments to production have been made that were inconsistent with the technical risks then remaining in the program.

Excessive Documentation

A continuing problem area is in the matter of documentation. This takes two forms:

- Technical documentation which the contractor is required to provide to the Government in responding to a request for proposal.
- Documentation pertaining to the management of the program by the contractor, if he wins the contract for the development. This includes not only the type of management, but the depth of management detail called for.

There is a growing feeling with respect to the former that not only has the Government been asking for too much depth of detail in the technical documentation, but the contractors frequently have overdone technical documentation on their own initiative, to convince the Government that their depth of knowledge of the system is such that they should be given the contract. We are going to try to stem this tendency toward excess technical documentation.

On the balance, management of our major programs is being accomplished by capable, well educated, highly motivated individuals. The magnitude of these programs, however, causes us not to be fully satisfied with our program management policies and organization. We believe that we probably need better and more extensive training for our program managers, a longer tenure in their jobs for both program managers and other key people in the System Program Offices. Further, a program manager frequently does not have authority to match his responsibility. In some cases, he needs clearer delineation as to what his responsibilities are. In his work he frequently is subjected to such a volume of directives that he cannot possibly be fully familiar and comply with them all. We need high quality, well trained and experienced program managers, with good teams working for them, in a framework of management which permits them to carry out their jobs with a minimum of impediments and extraneous requirements.

One of our major efforts in this connection will be to take a hard look at the composition and the curriculum of the Weapon Systems Management Course at the Defense Weapon Systems Management Center. Possibly the course should be made longer. Perhaps, we should turn out program managers with master's degrees in program management.

In summary, the thrust of our ongoing efforts in the field of defense weapon system acquisition management is this:

> **The management of defense weapon system acquisition is a titanic task involving the spending of billions of dollars a year covering many programs of a widely divergent nature. It is impossible to find one single policy or method of management which best fits all.**

We have tried many methods to get the most defense for each dollar expended. We have made some improvements in the past. More improvements in the future are necessary and planned. We may have overreacted in our handling of some problems. This we would like to avoid in the future. We want to correct and improve the management of our defense weapons system acquisition and do it as prudently as we can, after we are sure we have correctly identified a problem and developed an appropriate solution.

Air Force Systems Management—

Back to the Fundamentals

General James Ferguson, USAF

On the Washington scene, the advent of Vincent Lombardi as head coach of the Redskins has reminded us again that, when things are not going well, the first thing you do is go back to drilling in the fundamentals.

The acquisition of defense weapon systems has likewise not been going as well as it might; or, what is the same thing, it has not *appeared* to be going as well as it should. There are, of course, quite a few reasons. National tension and unrest have been compounding, aggravated by a growing frustration over the war in Southeast Asia, and resulting in a general disenchantment with anything military.

In that kind of climate, any apparent miscue in defense management —in cost, schedule, or performance— triggers a disproportionate avalanche of accusation, recrimination and investigation. These reactions tend to escalate as they are bounced off the walls of the Capitol, reflected on the face of the television tube, and splashed across the news and editorial pages of the printed media.

So we find ourselves the target of a concerted and widespread attack on the sinister-sounding "military/industrial complex."

That being the case, it is certainly time to get back to the *fundamentals* of sound management. The purpose of this article is to trace briefly how we may have gotten away from the fundamentals, how we are now getting back to them, and what the new directions in systems management will mean to the Air Force, the Air Force Systems Command, and the defense contractors.

For background, the Air Force of the 1950s made pretty much of its own systems development and deployment decisions. Program justification was based for the most part on Specific Operational Requirements approved by the Department of the Air Force. In 1955 and 1956, for example, I can recall something like 19 Strategic Air Command programs in the research and development mill; 4 interceptors; 11 applications of nuclear power to ground, aircraft, and space systems; 8 space projects; and all the so-called "L" systems for command, control, and communications. Systems in those days were relatively less sophisticated and, therefore, less costly; and, with the Air Force responsible for about 50 percent of the defense budget, there always seemed to be enough funding flexibility for new programs, as well as for modification and updating of older ones.

In that era, the Office of the Secretary of Defense (OSD) was a small advisory body, with little direct involvement or detailed analysis at that level. Management authority was delegated to the field, and quick decisions with minimum delay were characteristic of systems development. These were the basics, the fundamentals. But it is also quite possible that cost considerations, in those simpler days, were not accorded all the importance they deserved.

In the early 1960s, the national strategy of massive retaliation was overhauled along the lines of flexible response and multiple options. At the same time, exploding technology offered a wealth of options for alternative weapon and support systems—all at a price, of course, and the price was rising rapidly.

General James Ferguson, USAF, is Commander, Air Force Systems Command, with responsibility for providing the weapon systems and meeting the technological needs of the total Air Force mission. Before assuming his present command, General Ferguson served as Deputy Chief of Staff for Research and Development at Headquarters, U.S. Air Force.

So, given this great range of choices and the tremendous costs of the numerous alternatives, the new Secretary of Defense saw a need for tightened control from the top. The pendulum began a rapid swing in the reverse direction, away from the fundamentals of decentralized management. Mr. McNamara put into operation various control systems and mechanisms—such things, for example, as contract definition, or the quantification of alternative choices through the discipline of systems analysis and the cost/effectiveness ratio, and quite a few others that come readily to mind.

Emergency Measure

In seeking a cohesive allocation of finite resources according to broad roles and missions, these mechanisms and procedures were *fundamentally* sound. Further, if the move to tightly centralized control was a move *away* from the fundamentals, Mr. McNamara recognized that fact and considered the trend to be an emergency measure that could again be reversed. He wrote in 1964:

> **"I strongly believe in the pyramid nature of decision-making and that, within that frame, decision-making should be pushed to the lowest level in the organization that has the ability and information available to apply approved policy."**

In actual practice, however, we moved too far toward the opposite extreme from that of the 1950s. With a plethora of detailed decisions being made at the OSD level, there was a correspondingly massive requirement for detailed information, and for more and more technical people at that level.

This very rapid growth in the Office of the Secretary of Defense caused a parallel technical buildup of large proportions within the Air Staff of Air Force headquarters. There was a mass exodus of many of our best project officers topside, and most of them —with some abetment from the field —took their jobs with them. That left the Air Force Systems Command (AFSC) with a heavy mantle of responsibility but, in reality, short-circuited out of the decision loop by this migration of detailed management to a higher level. Dr. John Foster Jr., Director of Defense Research and Engineering, summed up the situation last summer when he said:

> **"For reasons which are now history, we find the Pentagon today with too much centralization of authority—but not responsibility —too much layering in the decision-making structure, too many reports to be written by people already too busy trying to manage."**

General John P. McConnell, just before retiring as Chief of Staff of the Air Force, put it into down-to-earth terms, and my own experience bears him out. When you are running a flying outfit, as he said, and a squadron commander goofs, you fire him. But in the procurement and development areas, he went on, it is virtually impossible to *find* the right one to fire. Too many people at too many levels have too much to say about the program. Very few of them are empowered to say "Go," while most are authorized to say "No." More likely, they are apt to say "more data" or "restudy."

This is not to say categorically that all of us in the Services were wholly without fault. Speaking for the Air Force, we have realized for some time that, on many occasions, after a virtual Niagara of studies and restudies, we let ourselves be stampeded into contract definition just to finally get going. In frustration, which is perhaps understandable under the circumstances but no less excusable, we have accepted and participated in program decisions without actually having the requisite technology sufficiently well in hand to proceed.

What that sort of thing does to schedules, performance and costs is too well known to require extensive elaboration. A few examples, such as the Short Range Attack Missile (SRAM), the Mark II Avionics, and the Minuteman missile guidance system, are representative. They amply illustrate the need for a far better balance among cost, performance and schedule, *not only* at the very beginnings of the system acquisition cycle, but *all the way through* to the final operational configuration.

New Policy of Decentralization

The new team in Washington has recognized and attacked the problem at the highest levels. President Nixon, with his strong stand on decentralization, has set the tone and furnished the policy framework. He has sent all of us back to the fundamentals. The Defense Department has been taking the necessary steps to get management back where it can truly manage. Dr. Foster has said:

> **"In the Office of the Secretary of Defense . . . you can see a shift toward added emphasis on future defense planning and away from the management of a given program. The senior civilians will require a detailed justification by the Services of a program, but once approved, the Services will run it. The Office of the Secretary of Defense will monitor the program—but hold the Services responsible for the proper conduct of the approved program."**

I am happy to say that the Secretary of the Air Force and the Chief of Staff have expressed their agreement with this return to management fundamentals. Headquarters, U.S. Air Force and AFSC have been actively working with OSD, the Defense Science Board, *and the other Services* on the complex problems of managing huge programs. We have made detailed recommendations along the entire spectrum, and their acceptance is inherent in the new policy that detailed review and the decisions on approved programs will be delegated to the lowest possible level.

AFSC Approach to New Responsibility

Within the Air Force, it would certainly seem to me that AFSC is the logical level. There is no higher level, in fact—in Air Force or Defense Department—at which all the essential ingredients for detailed review and timely decisions come together in clear focus. AFSC, after all, is the organization charged with maintaining the technical and managerial capability for balancing resources against thoroughly analyzed military requirements. At no other level of organization are all these ingredients constantly available for program deci-

sions during the total system procurement cycle.

That fact clearly pinpoints responsibility where it belongs, and AFSC is happy to meet the full challenge. In so doing, I feel that closest attention to the following areas will be essential:

- We are going to have to take a deep and very objective look into the operational capabilities required, and the time frame for their intended use. These considerations will be critical in establishing priorities for future efforts in a climate of curtailed funds and manpower. In this connection, I want to emphasize the tremendous need for judicious *selectivity* among the numerous choices technology dangles before us. As the President has said, "We are living today in a time of great promise—but also too many promises." The trend toward more elaborate frills and increased "gold plating"—which too often turns out to be tarnished when it reaches the field—*must* be reversed.
- We need a more comprehensive understanding of the technology involved and the state of the art available before we charge off into the wild blue. We must have better estimates of technical risks as weighed against performance requirements, costs, and delivery dates.
- We will have to have a flexible scheme of contracting to cover the research and development phases of the program, as well as production. We must recognize the fundamental differences between development and production, and tailor our contracting procedures accordingly.
- We must come up with far more definitive and realistic development schedules than we have done in the past. That means, for one thing, a more realistic use of analytical studies, *prototype development*, and advanced development of components in areas of high technical risk. *And* for another, there must be established definitive decision milestones at which we can assess the impact of problems in technology, costs, performance specifications, and time delays on the comprehensive acquisition schedule.

What all this says is that all our problems must be *visible* and susceptible of solution before a final commitment to production. By placing greater emphasis at the highest level on program approval processes *before* going to production, we assure that everyone—OSD, the Services, Congress, and the contractors—will have a full understanding of just what the base line is for what we are buying. Only with such a base line can we identify our problems and measure our progress against what we set out to do.

With this valid base line—knowing precisely what has really been approved—and with AFSC charged with the proper conduct of the program, we get back to the fundamentals of management, the basic principles. Detailed management information rises only as high as the level at which it is needed and can be useful; spans of control become realistic; and authority is once again wedded to responsibility.

Application to Major Systems Programs

To translate theory into action, the Air Force has been realigning certain functional responsibilities in the program management area. As of July 1969, for example, the F–15 program came under the direct management control of Headquarters, AFSC. The Office of the Assistant for F–15, reporting directly to me, has assumed the functions and responsibilities previously discharged by the Program Element Monitor (PEM) on the Air Staff. Consequently, the appropriate PEM personnel from the Pentagon have been transferred to AFSC headquarters at Andrews AFB, Md.

At the same time, the F–15 System Program Director, who formerly reported through the Commander of the Aeronautical Systems Division (ASD), now reports directly to me. He will, however, remain at ASD headquarters, Wright-Patterson AFB, Ohio.

The same type of organizational structure and alignment of responsibilities is also under consideration for the B–1 advanced bomber program. We anticipate going the same route for selected major programs of the future, once they have been approved for development and acquisition.

Meanwhile, other programs already under way are also candidates for a close tie-in to AFSC. This entails a shift of many of the Air Staff PEM functions to the appropriate AFSC staff agency as the focal point for detailed management information. Finally, we are considering much the same sort of process with regard to various advanced development programs.

I have discussed these changes in great detail with the System Program Directors (SPDs) directly affected, and charged them with surfacing problems and getting them to me as soon as they appear. The SPDs will thus be giving me detailed reports; emerging problems will be identified and resolved before they grow malignant and multiply out of control. Also, we will be paying very strict attention to costs, schedules, performance, and program decision requirements.

This in no way portends that we are trying to cut the higher levels out of the loop once they have approved a program. Rather, the purpose is to eliminate unnecessary briefing and reporting at all levels. We all realize that each level of organization must have the information necessary to fulfill its management responsibilities; but we also know we have to get rid of the study and restudy requirements from various staffs, offices, committees, and other reviewing agencies that have neither the authority nor the responsibility for program decisions.

In conjunction with the other Services, we are developing a standardized format with which we, in turn, report to higher levels. In my own case, for example, I will be highlighting problems of our major programs for the Secretary of the Air Force, the Chief of Staff, and OSD in a quarterly review—without the need for these higher levels to constantly review and drown in a flood of complex detail.

Thus, AFSC should become the Air Force focal point, in Washington, for comprehensive program management information. We will, as a result, be able to respond fully to the Secretary and the Chief of Staff, as well as to OSD levels; and these higher levels, in turn, can be responsive to the Congress through the System Acquisition Reports.

With these steps being taken to remedy genuine deficiencies—to get back to the fundamentals of systems management—it is not difficult to deduce the probable impact on our defense contractors. The controlling factor, obviously, is the real squeeze

on money and manpower that we can expect for at least the next few years —and very probably beyond. The necessity for the Services to get a great deal more value from every research and development and production dollar cannot help but have a profound effect on the industry.

Effect on Defense Contractor

For one thing, our look at past performance, as a factor in source selection, is going to be far deeper, more penetrating, and far more realistic.

"*Realism,*" in fact, is going to be the operative environment. There will, in the future, be very scant likelihood of low-cost buy-ins, or of our accepting performance specifications beyond those in the original definition, at the price of disproportionate cost increases.

We are going to be particularly resistant to Engineering Change Proposals (ECPs) for increased performance, whether they come from the contractor *or* the user. Any ECP is going to be looked at through a jaundiced eye, first to see if there is any real need for it at all and, second, if it passes that test, to determine what it would do to costs and schedules.

I think it would be reasonable to expect a definite move in the direction of hardware verification—prototyping —as a complement to the present flood of paper studies in the contract definition phase. I think of this as competitive "initial development" or, in effect, a "contract definition in hardware." After all, brochures *always* perform beautifully, but I frankly prefer—when it is at all possible—to see a piece of hardware proving *what* it can do, *when* it can probably be delivered, and *whether* it is worth the money it will cost. In this connection, we will be using all available techniques, including exploratory and advanced development, to validate system feasibility. We *must* ensure that we have a viable program *before* we commit ourselves to the major costs of development and production.

All in all, I would say, we can expect for the foreseeable future a trend to the very basic "necessities of life," at realistic and thoroughly justifiable price tags.

To sum up, AFSC analytical capability applied to Air Force mission requirements, added to the command's technical competence, together form a potential for producing the best and most advanced weapon systems in the world. When you add, as is now being done, the management authority necessary to really *control* your programs, that potential is much more likely to translate into reality. With these three ingredients—analysis, technology, and authority—working together with industry, we will be able to produce viable weapon systems that meet the nation's needs as fully as they can be met, are no more complex than they need to be to fulfill their functions, and are priced as close to their true worth as human effort can manage.

The Air Force, as I have described, is taking major constructive steps to remedy deficiencies that we ourselves have recognized for some time.

For our part, the Air Force Systems Command is definitely off and running, doing exactly what the highest levels of Government—and we ourselves—have all agreed should be done. We have, in short, gone back to the fundamentals.

Army Advisors to NASA for FY 1970 Named

Appointments of Army members of advisory committees to the National Aeronautics and Space Administration for FY 1970 have been announced.

Assistant Secretary of the Army, Research and Development, Charles L. Poor was chosen for another term on the Committee on Aeronautics; and Paul Yaggy, Director of the Army Aeronautical Laboratory, Moffett Field, Calif., was reappointed to the Subcommittee on Aircraft Aerodynamics.

Richard L. Ballard, of the Physical and Engineering Sciences Division, Army Research Office, was selected to serve on the Subcommittee for Aircraft Structures.

Richard T. Alpaugh, Chief of the Aircraft Power Section, Army Materiel Command (AMC), was named to the Subcommittee on Airbreathing Propulsion; Colonel Harry Jones, Chief, AMC Air Mobility Division, was appointed to the Subcommittee on Aircraft Operating Problems; and Hyman Rosenthal, adviser in the Metallurgy Research Laboratory, Frankford Arsenal, is on the Panel on Materials for Aircraft Engines.

DOD Standardization Documents Available

Orders for specifications and standards are accepted by the Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pa. 19120. Requestors should use DD Form 1425, if available, and should provide name, address, contract number, quantity, and specification and standard document number. Telephone orders are also accepted; phone (215) 697-3321.

More detailed information on obtaining copies of these documents is published in a "Guide for Private Industry," available from the Naval Publications and Forms Center.

The Defense Department Index of Specifications and Standards (DODISS), covering unclassified military and Federal specifications and standards published by the Naval Publications and Forms Center, is available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

A two-part publication, with alphabetic and numeric listings, DODISS is available in the United States at the annual subscription rate of $22. A listing by Federal Supply Classification is also available, at $12 per year.

B–1 Requests for Proposal Issued

Requests for Proposal (RFP) for the development of the B–1 strategic aircraft have been issued by the Air Force. Proposals are to be submitted to the Air Force by spring 1970 for evaluation, with awarding of engineering development contracts to follow.

Airframe RFPs went to North American Rockwell Corp., Los Angeles, Calif.; General Dynamics Corp., Fort Worth, Tex.; The Boeing Co., Seattle, Wash.; and Lockheed Georgia Co., Marietta, Ga. Engine RFPs were sent to Pratt and Whitney Co., Hartford, Conn.; and General Electric Co., Evendale, Ohio.

The B–1 is seen as the possible replacement aircraft for the B–52 in the Strategic Air Command's inventory. Formerly called the Advanced Manned Strategic Aircraft (AMSA), it would be capable of supersonic speeds.

ABOUT PEOPLE

DEPARTMENT OF DEFENSE

Philip A. Odeen has been appointed Dep. Asst. Secretary of Defense (Regional Programs) in the Office of the Asst. Secretary of Defense (Systems Analysis). This is a new position combining two Dep. Asst. Secretaryships, Regional Forces Programs and Southeast Asia Programs, which have been abolished. Mr. Odeen formerly served as Dir. of Southeast Asia Resources Div. in the Systems Analysis Office.

John H. Morse has been designated Dep. Asst. Secretary of Defense (European and NATO Affairs) in the Office of the Asst. Secretary of Defense (International Security Affairs).

Dr. George C. S. Benson, who has been Dir. of ROTC Programs reporting directly to the Asst. Secretary of Defense (Manpower and Reserve Affairs), has been appointed Dep. Asst. Secretary of Defense (Education). **Dr. Nathan Brodsky**, who has been Acting Dep. Asst. Secretary, will continue to serve in his regular capacity as Dir. of Education Programs and Management Training, and will be Principal Deputy to Dr. Benson.

VAdm. Harold G. Bowen, USN, has been assigned to the Office of the Asst. Secretary of Defense (Administration) as Dep. Asst. Secretary of Defense (Intelligence).

New Commander of the Defense Supply Agency's Defense Fuel Supply Center, Aexandria, Va., is **Maj. Gen. Charles C. Case, USA**. He succeeds **RAdm. Fowler W. Martin Jr., SC, USN**, now Commander, Defense Electronics Supply Center, Dayton, Ohio, replacing **Brig. Gen. Glen J. McClernon, USAF**, who retired on Nov. 1.

DEPARTMENT OF THE ARMY

Brig. Gen. Winant Sidle, who has for the past two years served in Vietnam first as Chief of Information for the U. S. Military Assistance Command, Vietnam, and later as Commanding General, I Field Force Artillery, is the new Chief of Information for the Department of the Army.

New personnel assignments made in the Army Materiel Command are:

Maj. Gen. John R. Guthrie, Dir., Research, Development and Engineering, Hq., AMC; **Maj. Gen. John L. Klingenhagen**, Commanding General, Army Aviation Systems Command, St. Louis, Mo.; **Brig. Gen. Edwin I. Donley**, Commanding General, Army Missile Command, Redstone Arsenal, Ala.; **Brig. Gen. George M. Bush**, Commanding General, Army Mobility Equipment Command, St. Louis, Mo.; **Brig. Gen. (designee) Alvin C. Isaacs**, Dep. Commanding General, Army Tank-Automotive Command, Rock Island Arsenal, Ill.; **Col. William D. Meara**, Dep. Commander, Aberdeen Proving Ground, Md.; **Col. Eugene W. McGinnis**, Chief of Staff, Army Missile Command, Redstone Arsenal, Ala.; **Col. John R. Adie**, Commander, Army Aviation Materiel Laboratories, Ft. Eustis, Va.; and **Col. Vitaly Kovalevsky**, Dir., Infantry Materiel Testing, Army Test and Evaluation Command, Aberdeen Proving Ground, Md.

Recent staff assignments in the Office of the Chief of Research and Development (OCRD) include: **Col. Raymond L. Martin**, Chief, Communications-Electronics Div., and **Col. Joseph B. Love**, Dep. Dir., Plans and Programs. Also under OCRD, **Lt. Col. George G. Tucker Jr.**, Commanding Officer, U. S. Army Research Office-Durham, Durham, N. C., replacing **Col. Donovan F. Burton** who has retired; and **Col. Rudolph A. Axelson**, Commanding Officer, Army Limited War Laboratory, Aberdeen Proving Ground, Md.

Brig. Gen. (designee) Thomas W. Brown assumed command of the Army Combat Developments Command Experimentation Command, Ft. Ord, Calif., on Dec. 15; and **Brig. Gen. (designee) Edward B. Kitchens Jr.** is the new Commanding General, Combat Arms Group, Combat Developments Command, Ft. Leavenworth, Kan.

Col. Avery S. Fullerton has been assigned District Engineer for the Jacksonville (Fla.) District of the Army Corps of Engineers.

DEPARTMENT OF THE NAVY

In the Office of the Chief of Naval Operations, **RAdm. Jerome H. King Jr.** has been designated Dir., Ship Characteristics Div. and Chairman, Ship Characteristics Board; and **RAdm. (designee) James W. Nance** has been assigned as Asst. Dir., Strategic Plans Div.

RAdm. Kent L. Lee is the new Asst. Commander for Logistics and Fleet Support, Naval Air Systems Command, Washington, D. C.

Capt. Richard E. Jortberg has been assigned to the Deep Submergence Systems Project Office, 6900 Wisconsin Ave., Chevy Chase, Md., as Special Projects Officer.

Capt. Henry D. Arnold has been designated Executive Asst. to the Asst. Secretary of the Navy (Research and Development).

New Commander, Midwest Div., Naval Facilities Engineering Command, Great Lakes, Ill., is **Capt. Joseph W. Gorman.**

Capt. Robert Ennis has been assigned Asst. Commander, Naval Ordance Laboratory, White Oak, Md.

DEPARTMENT OF THE AIR FORCE

Maj. Gen. Joseph S. Bleymaier, Dep. Dir., MOL Program, Office of the Secretary of the Air Force, (located at Los Angeles, Calif.) has retired.

Brig. Gen. Richard L. Ault is the new Asst. to the Dir. of Plans, Office of the Dep. Chief of Staff, Plans and Operations, Hq., USAF. He replaces Brig. Gen. Charles W. Lenfest who has retired.

In the Air Force Systems Command, **Brig. Gen. Guy M. Townsend** has been reassigned from Dep. for Systems Management to Systems Program Dir. for the B–1 aircraft program at the Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

Research and Development Information for Industry

Lieutenant Colonel John A. Shanahan, USA

Mindful of the importance of the contribution by industry to the solution of the U.S. Army's future materiel needs, the Chief of Research and Development has established three broad means to provide timely, authoritative planning information to industry. These are: advanced planning briefings and symposia; provision of significant documents to industry; and information provided by the Army industrial liaison offices located at all major Army development commands (see Figure 1).

The ultimate objective of Army research and development is weapons, equipment and techniques qualitatively superior to those of any potential enemy. The Army recognizes it must keep industry informed of long-range research and development plans concerning future materiel requirements and objectives, so that industry can properly respond.

Sources of Information

The Army research and development program is the result of considerable study and planning, an attempt to chart a course 20 years into the future. Long-range planning guidance for research and development is found in several Department of the Army planning documents. These contain organizational, operational and materiel concepts for the next 20 years. In addition, technological forecasts are prepared for the same 20-year period. Because of their sensitive nature, none of these documents are distributed to industry, although the research and development implications are found in other documents that are available for review.

The Army Research Plan guides research and exploratory development and is the vehicle for planning courses of action leading to advances in the scientific and technological base. It must support the desired operational capabilities that are derived from the Army Concept Program.

Combat Development Objectives Guide contains information on long-range plans developed by the U.S. Army Combat Developments Command. This document states future Army requirements. Commonly called the CDOG, it contains six types of entries that directly concern Army research and development:

- General Objectives.
- Operational Capability Objectives.
- Qualitative Materiel Development Objectives.
- Advanced Development Objectives.
- Qualitative Materiel Requirements.
- Small Development Requirements.

A Qualitative Materiel Development Objective (QMDO) states that a need exists for a certain kind of equipment, materiel, or system, but that the feasibility of successful development is not known, and research and/or exploratory development are still necessary. Specific detailed descriptions are not included in these entries since they do not lend themselves to this kind of definition.

An Advanced Development Objective (ADO) is a statement of military needs, approved by the Department of the Army, for development of items for experimental or operational test, in order to clarify cost, operational

Lieutenant Colonel John A. Shanahan, USA, is assigned to the Industrial Liaison Branch, Technical and Industrial Liaison Office, Office of the Chief of Research and Development. He is a graduate of the Army Command and General Staff College and the National Security Management Course of the Industrial College of the Armed Forces. He holds a bachelor of general education degree from the University of Omaha, Neb.

and/or technological factors prior to commencing engineering development.

The Qualitative Materiel Requirement (QMR) differs from the QMDO in that the technical and scientific feasibility of developing the items or systems is known, or, as it is sometimes stated, development is within the state of the art or soon will be. The QMR is more specific in its definition and description of what it required. The QMR guides engineering development of an item for Service use.

A Small Development Requirement (SDR) is a statement of a need for a piece of equipment that is not complex or expensive enough to warrant formal establishment of a QMR. SDRs are published as an appendix to CDOG. They have the same effect as a QMR with regard to authorization for a program. The difference lies in the size, cost and developmental lead time of the items or systems envisioned, and in the probability that SDRs can be achieved with fewer reviews and studies.

Research and Development Planning Summary (DD Form 1634 which is replacing DD Form 1498) contains research and development progress information, including the location where the work is being accomplished and the individual responsible for the project or task.

Who May See Long Range Planning Documents?

Representatives of qualified industrial, scientific, or other civilian organizations may see specific portions of these documents when a clear "need-to-know" has been established. The Office of the Chief of Research and Development, Department of the Army, determines "need-to-know" after examining the limits of the organization's expressed areas of interest, evaluating the research and development capabilities of the organization, and considering the Army's need for civilian participation in the research and development efforts within these areas of interest.

A qualified potential recipient of research and development information is a U.S. citizen, firm, partnership, corporations, or other type civilian organization which has:

- Expressed a desire to participate in the research and development effort of the Army.
- Obtained the required industrial personnel and facility security clearances.
- Provided acceptable evidence of a research and development capability in being. In cases where the organization's area of interest exceeds its capability in being, it must provide acceptable evidence of a realistic and feasible intent to expand the capability adequately.

Where Can Documents Be Seen?

Planning documents can be reviewed daily by qualified industry representatives at the Technical and Industry Liaison Office (TILO), Office of the Chief of Research and Development, located in Room 3D380, The Pentagon. Companies may schedule a reading room for a half day, or a full

U.S. Army Points of Contact for Research and Development Plans

U.S. Army Combat Developments Command
ATTN: CDCCS-RI Col. J. W. Ryan
Ft. Belvoir, Va. 22060
Phone: (703) 664-6766

U.S. Army Combat Developments Command
West Coast Liaison Office
Suite 204 Lt. Col. Alfred J. Spaulding
8816 Sepulveda Blvd.
Los Angeles, Cal. 90045
Phone: (213) 645-4735

U.S. Army Materiel Command
ATTN: AMCRD-PS-TILO John Konopka
Washington, D.C. 20315
Phone: (202) OX 5-3127

U.S. Army Munitions Command
ATTN: AMSMU-RE-P George Watson
Dover, N.J. 07801
Phone: (201) 328-2174

U.S. Army Electronics Command
ATTN: AMSEL-S Jack Mannix
Ft. Monmouth, N.J. 07703
Phone: (201) 535-2240

U.S. Army Tank-Automotive Command
ATTN: AMSTA-RR-F Edward Mackiewicz
Warren, Mich. 48090
Phone: (313) 756-1000 Ext 35242

U.S. Army Weapons Command
ATTN: AMSWE-REF Hugh Saunders
Rock Island, Ill. 61202
Phone: (309) 794-6001 Ext. 5157

U.S. Army Missile Command
ATTN: AMSMI-RFE Julian S. Kobler
Redstone Arsenal, Ala. 35809
Phone: (205) 876-2722

U.S. Army Aviation Systems Command
ATTN: AMSAV-GL(AMR) Eric Peterson
St. Louis, Mo. 63166
Phone: (314) 268-2045

U.S. Army Mobility Equipment
Research and Development Center
ATTN: SMEFB-RDE-O Hyman Graus
Ft. Belvoir, Va. 22060
Phone: (703) 664-5120

Figure 1.

COMPANY LETTERHEAD

Chief of Research and Development
Department of the Army
ATTN: Security Officer
Washington, D.C. 20310

Reference: DOD Industrial Security Regulation 5220.22–R, paragraph 3–201b.

In accordance with reference, approval is requested for the following employees to visit your facility:

Full Name Clearance, date issued Date, place of birth
Job title

Purpose of visit: To visit TILO.

Dates of visit:

Person to be contacted: (In Army, if known.)

Statement of facility clearance: XYZ Corp. has a (type of clearance) facility clearance granted on (date) by (granting agency).

I certify that clearance information set forth above is correct.

Approval for this visit is assumed, unless information to the contrary is received.

Cognizant security office for the corporation is (name of DCASR or other office).

I. M. Secure
Security Officer

Figure 2.

day on the first visit. Three briefing rooms give the TILO capacity to accommodate up to six industrial representatives a day.

Companies must make appointments at least two weeks in advance. The aforementioned requirements for qualification and a statement of specific areas of interest must be made in writing to:

Chief of Research and Development
Department of the Army
ATTN: Chief, Technical and Industrial Liaison Office
Washington, D.C. 20310

At the same time, a visit authorization request must be sent to:

Chief of Research and Development
Department of the Army
ATTN: Security Control Officer
Washington, D.C. 20310

The two-week lead time is important for the visit authorization request. This time is needed for mailing and processing. Information to be included in the visit authorization request is shown in Figure 2.

The request for visit may be made to cover a one-year period. This is provided for in DOD Industrial Security Regulation 5220.22–R, paragraph 3–201b. This reference should be noted on the request for visit. The request should be annotated to indicate that the individual representative has been designated by his company as an authorized messenger for transmission of classified material. The request should also be annotated with the phrase, "To visit TILO."

For further information, contact the Chief, Technical and Industrial Liaison Office, at address given previously, or by telephone: (202) OX 5–6496 or OX 5–6471.

SCAD Program Office Established at ASD

The Air Force Systems Command has established a System Program Office for a proposed decoy missile at the Aeronautical Systems Division's Deputate for Development Planning, Wright-Patterson AFB, Ohio.

The missile, called the Subsonic Cruise Armed Decoy (SCAD), is designed to be launched from strategic bombers singly or in multiples.

Study contracts for SCAD have already been awarded by the Air Force. Systems design contracts went to Beech Aircraft Co., Wichita, Kan.; The Boeing Co., Seattle, Wash.; and Lockheed Missile and Space Co., Sunnyvale, Calif. The high-energy fuel study contract went to AiResearch Manufacturing Co., Garret Corp., Phoenix, Ariz.; and the contract for the decoy system study was awarded to the Cornell Aeronautical Laboratory, Buffalo, N.Y.

USAF Sets Up Mallard Detachment

The Air Force Systems Command's Electronic Systems Division has established Detachment 13, located near Ft. Monmouth, N.J., as the Air Force's command authority for personnel assigned to the Mallard Project. Responsibilities include assisting in Mallard system design, development and management.

Mallard is a U.S. joint Services and international project to design, develop and procure a tactical communications system satisfying combat zone requirements.

Colonel Clifton L. Nicholson is commander of Detachment 13.

Logistic Manager of Wide Variety of Military Items and Equipment

Brigadier General John D. Hines, USA

Imagine the Great Wall of China made of sandbags—a wall 25 feet wide at the top, stretching 225 miles. Or, just imagine 1,353,410,000 sandbags. The Defense General Supply Center, Richmond, Va., has procured that number of sandbags since 1965.

A field activity of the Defense Supply Agency (DSA), the Defense General Supply Center (DGSC) is one of the six commodity-oriented centers which provide logistic support primarily to the Military Services. The DGSC general supply management responsibility ranges from mess kits to infrared aerial film, from kitchen equipment to airfield lighting equipment, from school and library supplies to the chaplain's wine, from antifreeze to compressed gas. Many of the items, for which the center is responsible, support 32 primary military weapon systems. DGSC catalogs about 300,000 items.

The mission of DGSC consists of the following assignments:

- To organize, direct and control the supply management functions in assigned military supplies for the Defense Department.
- To receive, store, care for and preserve, and ship material under DGSC management.
- To supply management of the civil defense needs of the United States.
- To procure school supplies and library material for overseas dependent schools and to procure non-Federal stock numbered books and publications for continental U. S. and overseas activities.
- To supply management of general-type, chemical and packaged fuel items for the Armed Services. This function is the largest in DGSC's mission.

Organization

The Defense General Supply Center organization consists of six staff elements and five directorates. The Office of Planning and Management is the principal staff advisor and assistant to the commander in directing the execution of policies relating to plans, programs, review and analysis, systems and procedures, management analysis and engineering, and manpower control. The Office of the Comptroller is the principal advisor on financial and budgetary management matters, and the Office of Data Systems supports the logistic responsibilities of DGSC and tenant activities. The remaining offices include civilian personnel, counsel, and the personal staff, the latter consisting of the small business specialist, public affairs officer, and the military personnel officer.

The five directorates include Storage and Transportation, Installation Services, Supply Operations, Procurement and Production, and Technical Operations. Storage and Transportation is responsible for the receipt, storage, transportation and issue of material at Richmond. Installation Services conducts the administrative, housekeeping and property disposal functions of the installation. The Directorates of Supply Operations, Procurement and Production,

Brigadier General John D. Hines, USA, is Commander, Defense General Supply Center. Prior to this command, he served as Commander, Defense Industrial Supply Center, Philadelphia, Pa., and Commander, Army and Air Force European Exchange System.

and Technical Operations are the activities which perform nationwide supply management of general type, chemical and packaged fuel items for the Services.

Supply Operations

Inventory management is exercised over more than 100,000 stocked items, from the mundane to the sophisticated. Because the variety of materials managed do not have similar control characteristics, *i.e.*, shelf life, commercial availability, cost or weapon system essentiality, different management techniques are employed for the various categories of items. To fill the more than 1.8 million annual requests for material, DGSC's inventory is stored in large wholesale distribution depots throughout the continental United States, and keeping depot inventories at required levels is the job of the Directorate of Supply Operations.

The directorate's commodity analysts can be likened to "buyers" in private industry, as they determine "what," "how much," "where" and "when." (Actual procurement and contracting responsibilities, however, are assigned to the Directorate of Procurement and Production.)

Inventories are constantly analyzed and evaluated quantitatively, qualitatively and financially. The algebraic sum of forecasted requirements is compared with inventory assets and the result is the command budget. After review at DSA headquarters and higher levels of authority, a funding program is allotted. The Directorate of Supply Operations schedules procurement in a manner that optimizes use of funds and inventory requirements.

In addition to support of normal requests for material, the directorate is responsible for the acquisition and positioning of various reserve inventories for war or other operational emergencies. It supports the civil defense mission of the Defense Department. This involves inventory management, storage and issue of survival supplies for stocking fallout shelters, as well as similar management of radiological defense instruments and disaster relief type engineering equipment. Technical assistance is provided with regard to radiological and engineering equipment.

DGSC Distribution Activity

The Directorate of Supply Operations handles DGSC's distribution network. From the point at which an item enters the distribution system, until it is sent to the requisitioner, the directorate provides instructions on its travel.

DGSC is linked to an automatic, electronic high-speed data communications switching network which provides a high-capacity means of exchanging data with the Services and the entire DSA supply system. Over this network, by means of either punch card or magnetic tape, the Military Service requisitioner sends his request for supplies directly to Richmond, ready for processing by the DGSC computer operation.

In many cases, the computer determines where the necessary supplies are stored, considers factors such as location of the requisitioner, and automatically selects the most logical site in the DGSC distribution system from which shipment can be made. Then, over the communications network, the computer instructs the specific site to ship supplies to the requisitioner.

The automatic data processing equipment and the communications system also permit better application of other management techniques in the directorate's supply operation.

The continuing materiel management study provides information giving a complete record on each item, the item's stock balance, and where the item is stored, which is programmed into the computer. The computer then indicates when the stock reaches the reorder point, or it can carry the automation one step further. When the reorder point of the item is reached, the computer compiles all necessary data, records all changes on tape, and then automatically prints out the purchase request, including previous buy history, item description and technical data required to support the procurement.

A second method, adopted to keep DGSC abreast of contemporary military logistics, is the economic quantity principle, by which procurement is compared against storage, and stock quantity is determined by the most economical buy.

In an effort to give requisitioners the best possible service, DGSC established an Emergency Supply Operations Center (ESOC). ESOC is equipped with a special telecommunications system, and is staffed 24 hours a day, ready to give attention to high-priority requisitions.

Procurement and Production

The Directorate of Procurement and Production processes procurement directives, developed by the Directorate of Supply Operations, through the bid and award procedures, and executes contracts with manufacturers or suppliers. In addition to DGSC-managed items, the directorate purchases supplies to fulfill DGSC's educational supply mission, and buys for the Military Services under a DOD-coordinated procurement program. The directorate accounts for and controls center-owned property in the hands of contractors and government plants.

During FY 1968, procurements at the center totaled $511.5 million. The figure for FY 1969 was down, totaling $436 million. Another statistic to illustrate the directorate's procurement rate is that every 60 seconds of every working day a contract is executed, and every 20 seconds DGSC purchases an industry item.

Last year DGSC purchased 216 million pounds of aluminum powder, totaling approximately $75 million. This was enough powder to make 288 million rolls of aluminum foil, or about six 25-yard rolls for every family in the United States. From Dec. 1, 1967, to Nov. 30, 1968, DGSC purchased 8 million library books, worth approximately $3.5 million. Also, last year the center purchased $50 million in photo supplies.

The directorate's Special Purchase Division, or SPUR, deals with nonstandard or non-stocked items related to general supply material. Approximately 90 percent of the SPUR-purchased items are under $2,500, and last year 85,889 purchases were made by SPUR.

Technical Operations

The Directorate of Technical Operations develops, publishes and maintains the DOD section of the Federal Supply Catalog for military general supplies. Through standardization and simplification projects, it conducts continuous item reduction programs, and furnishes guidance for substituting and interchanging items.

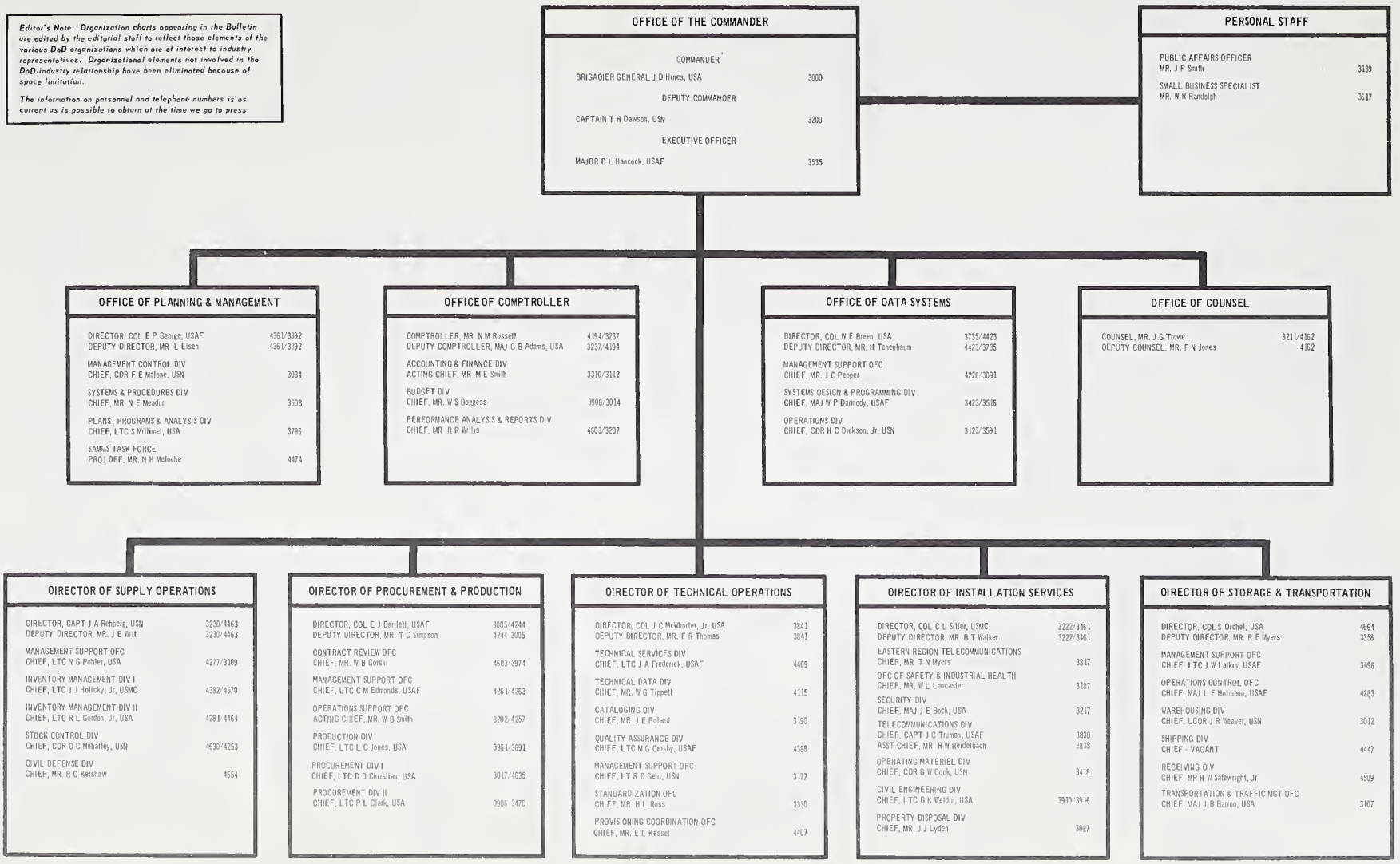
DEFENSE GENERAL SUPPLY CENTER

RICHMOND, VIRGINIA 23219

PHONE (703) 275-3861

Editor's Note: Organization charts appearing in the Bulletin are edited by the editorial staff to reflect those elements of the various DoD organizations which are of interest to industry representatives. Organizational elements not involved in the DoD-industry relationship have been eliminated because of space limitation.

The information on personnel and telephone numbers is as current as is possible to obtain at the time we go to press.



PALLETIZED SANDBAGS ready for shipment overseas. Since 1965, the Defense General Supply Center has purchased more than 1.3 billion sandbags, valued at more than $301 million.

The directorate is primarily concerned with carrying out the DSA quality and reliability policies and procedures for the center. In performing these tasks, the directorate has three functions: laboratory management, including product listing procedure and sources for their accomplishment, and monitoring testing of field-submitted samples by government laboratories; liaison with field inspection personnel; and providing necessary quality assurance support to other elements of DGSC, DSA, storage and maintenance sites, and contracting officers.

Value Engineering

One of the directorate's responsibilities is DGSC's value engineering program. A two-phase program, it has the goal of reducing the cost of the defense budget through the use of value engineering procedures and techniques.

The first phase of the DGSC value engineering program is the in-house effort to review, investigate, and develop and coordinate ideas for reducing the procurement cost of items for which DGSC has management and procurement responsibility.

The second phase is the responsibility to promote and increase the emphasis of government contractor participation in the incentive portions of the program though Value Engineering Change Proposals.

Although the DSA supply centers have logistic management responsibilities for the items they procure, the Services retain the prerogative to develop the technical requirements of the items they use. This means that, upon receiving a Value Engineering Change Proposal or Engineering Change Proposal from a manufacturer on a given contractual requirement, the DGSC procurement contracting officer, in administering the procurement, must coordinate and receive acceptance or rejection from the engineering support activity within the Service responsible for the item. DGSC assistance in this area can result in savings of time and money for both the contractor and the Government.

Value engineering, coupled with industrial know-how, can increase profits and decrease defense spending. Past experience has shown that value engineering actions have also resulted in product improvement, through the use of the latest state-of-the-art advances.

From value engineering to computer-process requisitioning, DGSC is aiming at DSA objectives of effective logistic support for our operating forces, cost reductions to "stretch" tax dollars, and efficient contract administration services in support of defense contractors.

ESD Establishes New Deputate for Computers

[Editor's Note: Readers may wish to add this new deputate to the organization chart of ESD, published in the *Defense Industry Bulletin*, Dec. 1969, page 3.]

A major reorganization of the Air Force Systems Command's Electronic Systems Division (ESD), L.G. Hanscom Field, Mass., has been announced. The creation of a new Deputy for Command and Management Systems was made to centralize ESD's computer-based activities.

Included in the new deputate are: the Electronic Data Processing Equipment Office, responsible for all Air Force management-type computer purchasing; the portion of the Space Defense and Command Systems Program Office dealing with acquisition of command systems; portions of the Directorate of Planning and Technology involved in command system design and development; and the Air Force computers located at Hanscom Field.

Several factors influenced the establishment of the new deputate, including the requirements for major updates of existing equipment to meet future needs; standardization requirements in the design, acquisition and integration of systems; and the opportunity for improvements through new technology.

BIBLIOGRAPHY

RESEARCH REPORTS

Organizations registered for service may obtain microfiche copies of these documents without charge from:

Defense Documentation Center
Cameron Station
Alexandria, Va. 22314

All organizations may purchase microfiche copies (65¢) or full-size copies ($3) of the documents (unless otherwise indicated) from:

Clearinghouse for Federal and Scientific Information
Department of Commerce
Springfield, Va. 22151

1969 Spring Superconducting Symposia (Proceedings of First Symposium). Naval Research Laboratory, Washington, D.C., March 1969, 64 p. Order No. AD–692 381.

Spacecraft Fires. Defense Documentation Center, Alexandria, Va., July 1969, 18 p. Order No. AD–689 800.

Organolead Chemistry: Synthesis and Applications. U.S. Army Natick Laboratories, Natick, Mass., May 1969, 49 p. Order No. AD–691 725.

Two-Photon Absorption in Alkali Halides. Naval Electronics Laboratory, San Diego, Calif., March 1969, 44 p. Order No. AD–691–800.

Synthesis of N-Acetlyhydrazobenzenes and Their Acid Catalyzed Rearrangements. Air Force Materiels Laboratory, Wright-Patterson AFB, Ohio, June 1969, 59 p. Order No. AD–692 108.

Holographic Interferometry—Techniques and Applications. U.S. Army Weapons Command, Rock Island, Ill., June 1969, 28 p. Order No. AD–691 131.

A Technique for Evaluating Titanium Alloys by Melting, Processing, and Testing Miniature Ingots. Naval Ship Research and Development Laboratory, Annapolis, Md., July 1969, 55 p. Order No. AD–691 245.

A Heuristic Programming System. U.S. Naval Weapons Laboratory, Dahlgren, Va., April 1969, 94 p. Order No. AD–690 446.

The Table Driven Augmented Programming Environment: A General Purpose User-Oriented Program for Extending the Capabilities of Operating Systems. Rome Air Development Center, Griffis AFB, N.Y., June 1969, 126 p. Order No. AD–690 606.

High Temperature Reactions and Phase Equilibria in the Strontium Oxide-Zirconium Oxide System. Air Force Materiels Laboratory, Wright-Patterson AFB, Ohio, May 1969, 93 p. Order No. AD–690 615.

Investigation of Colorless and Water-Based Concrete Curing Compounds. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss., June 1969, 64 p. Order No. AD–689 539.

Electrode-Electrolyte Interaction During Electrochemical Hydrocarbon Oxidation. U.S. Army Electronics Command, Fort Monmouth, N.J., June 1969, 22 p. Order No. AD–691 108.

Application of a Theory of Binary Solution Surface Tension to Interfacial Tension Phenomena. Naval Ship Research and Development Laboratory, Annapolis, Md., July 1969, 23 p. Order No. AD–691 244.

Measurement of Fluoride Activity and Concentration in Seawater Using a Lanthanum Fluoride Electrode. Naval Research Laboratory, Washington, D.C., July 1969, 14 p. Order No. AD–691 201.

Tables of Associated Legendre Function of the First and Second Kind of Very Large Degree With Arguments Near Unity. Naval Research Laboratory, Washington, D.C., June 1969, 58 p. Order No. AD–690 866.

Oceanography. Defense Documentation Center, Alexandria, Va., June 1969, 645 p. Order No. AD–689 700.

Surface Chemistry of Plastics Reinforced by Strong Fibers. Naval Research Laboratory, Washington, D.C., May 1969, 30 p. Order No. AD–688 103.

Bibliography of Moving-Coil (Dynamic) and Impulse Type Underwater Electroacoustic Transducers. Naval Research Laboratory, Orlando, Fla., April 1969, 43 p. Order No. AD–686 378.

GOVERNMENT PRINTING OFFICE PUBLICATIONS

These publications may be purchased at the prices indicated from:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402.

DOD and NASA Incentive Contracting Guide, October 1969. Presents a set of guidelines to incentive contracting based on present Armed Service Procurement Regulations. Order No. 0–364–685. $2.

MILSTRIP, Military Standard Requisitioning and Issue Procedures, Change 22, May 1969. 38 p. D7.6/4:M 59/ch. 22. 40¢.

DEFENSE PROCUREMENT CIRCULARS

Distribution of Defense Procurement Circulars is made automatically by the U.S. Government Printing Office to subscribers of the Armed Services Procurement Regulation (ASPR).

Defense Procurement Circular No. 73, Sept. 26, 1969. (1) Management Control Systems List. (2) Memo from the Assistant Secretary of Defense (I&L) on Third Country National Dollar Remittances. (3) Employment of Individuals on Contracts in Vietnam. (4) First Article Approval. (5) Application of Indirect Costs to Work Performed at Off-site Locations. (6) Pre-Award Compliance Check. (7) Small Business Size Standards. (8) Health, Safety and Accident Prevention Clauses. (9) Determining Defective Pricing (PL 87–653) of Contracts. (10) Revision of Standard Forms.

Defense Procurement Circular No. 74, Oct. 10, 1969. (1) Subcontractor Cost or Pricing Data and Audit Requirements.

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MEETINGS AND SYMPOSIA

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Atomic Molecular and Solid State Physics and Quantum Biology Symposium, Jan. 19–24, at the University of Florida, Gainesville, Fla. Sponsor: Air Force Office of Scientific Research. Contact: Lt. Col. R. A. Houdibre, Air Force Office of Scientific Research (SRPS), 1400 Wilson Blvd., Arlington, Va. 22209. Phone (202) 694–5588.

FEBRUARY

Sleep Cycles and Behavior Conference, Feb. 5–7, at San Diego State College, San Diego, Calif. Sponsor: Office of Naval Research. Contact: Dr. Laverne C. Johnson, U. S. Navy Medical Neuropsychiatric Research Unit, San Diego, Calif. 92152. Phone (714) 233–2481.

MARCH

Instrumentation for Nuclear Effects Simulation Symposium, March 12–13, at Sheraton Western Skies Motor Hotel, Albuquerque, N. M. Sponsor: Air Force Special Weapons Center. Contact: Herbert M. Fernandez, Air Force Special Weapons Center (SWVI), Kirtland AFB, N.M. 87117. Phone (505) 247–1711, ext. 2035.

Prospects in Mathematics Symposium, March 16–18, at Princeton University, Princeton, N.J. Co-sponsors: Air Force Office of Aerospace Research and Princteon University. Contact: Maj. W. R. Trott, Air Force Office of Scientific Research (SRMM), 1400 Wilson Blvd., Arlington, Va., 22209. Phone (202) 694–5264.

Fourier Spectroscopy Symposium, March 16–29, at Aspen, Colo. Sponsor: Air Force Cambridge Research Laboratories. Contact: A. T. Stair Jr., Air Force Cambridge Research Laboratories, L.G. Hanscom Field, Bedford, Mass. 01731, phone (617) 274–6100, ext. 4911; or George Vanasse, Air Force Cambridge Research Laboratories, phone (617) 274–6100, ext. 3455.

Thermodynamics and Thermophysics Symposium, March 23–24, at the Lockheed Missiles and Space Co., Sunnyvale, Calif. Co-sponsors: Air Force Office of Scientific Research and Lockheed. Contact: Maj D.L. Calvert, Air Force Office of Scientific Research, 1400 Wilson Blvd., Arlington, Va. 22209. Phone (202) 694–5567.

Polytechnic Institute of Brooklyn **Submilliter Waves** Symposium, March 31–April 2, at the Commodore Hotel, New York, N.Y. Sponsors: Air Force Office of Scientific Research, Office of Naval Research and the Army Research Office. Contact: Lt. Col. H. W. Jackson, Air Force Office of Scientific Research (SREE), 1400 Wilson Blvd., Arlington, Va. 22209. Phone (202) 694–5565.

APRIL

Army **Numerical Analysis** Conference, April 2–3, at Ft. Belvoir, Va. Sponsor: U. S. Army Research Office-Durham. Contact: Lt. Col. Edgar G. Hickson Jr., U. S. Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706. Phone (919) 286–2285.

International Mathematical Conference on Several Complex Variables, April 5–17, at the University of Maryland, College Park, Md. Co-sponsors: Air Force Office of Scientific Research and the Office of Naval Research. Contact: Maj. W.R. Trott, Air Force Office of Scientific Research (SRMM), 1400 Wilson Blvd., Arlington, Va. 22209. Phone: (202) 694–5264.

Twenty-fourth Annual **Frequency Control** Symposium, April 27–29, at Atlantic City, N.J. Sponsor: Solid State and Frequency Control Division, Electronic Components Laboratory, Army Electronics Command, Ft. Monmouth, N.J. Contact: V. J. Rublin, Chief, Solid State and Frequency Control Division Electronic Components Laboratory, Army Electronics Command, Ft. Monmouth, N.J. 07703. Phone (201) 535–2250.

MAY

Twenty-fourth Annual **Power Sources** Symposium, May 19–21, at the Electronic Components Laboratory, Army Electronics Command, Ft. Monmouth, N.J. Co-Sponsors: Electronic Components Laboratory, U.S. Army Electronics Command, and the Interagency Advanced Power Group. Contact: David Linden, Deputy Chief, Power Sources Division, Electronic Components Laboratory, Army Electronics Command, Ft. Monmouth, N.J. 07703, or Arthur R. Daniel, Electronic Components Laboratory, Army Electronics Command.

NDTA Sets 1970 Meetings

The National Defense Transportation Association (NDTA) has announced its schedule for 1970 meetings. The meetings, dates and locations are:

- Fourth International Transportation Seminar, Feb. 9–11, Honolulu, Hawaii.
- Pacific Southwestern Territorial Meeting, Feb. 19–20, Las Vegas, Nev.
- Second Far Eastern International Transportation Conference, March 8–11, Tokyo, Japan.
- Southeastern Territorial Meeting, March 24–25, Memphis, Tenn.
- Eastern Territorial Meeting, April 8–9, McGuire AFB, N.J.
- Southwestern Territorial Meeting, the week of April 12, Fort Hood, Tex.
- Central Territorial Meeting, April 22–23, Colorado Springs, Colo.
- Seventh European Conference. April 29–May 1, Venice, Italy.
- Silver Anniversary Transportation and Logistics Forum, Sept. 20–23, San Francisco, Calif.

For further information, contact the National Defense Transportation Association, 1612 K Street NW, Suite 706, Washington, D.C. 20006, telephone (202) DIstrict 7–3530.

Experiences with Incentives—Changes Needed

Address by Robert D. Lyons, Dir. for Procurement Management, Office of Asst. Secretary of Defense (Installations and Logistics), at the National Contract Management Association National Symposium and Educational Conference, Washington, D.C., Oct. 13, 1969. [*This address was delivered for Mr. Lyons by Jack Livingston, Procurement Analyst in the Directorate for Procurement Management.*]

Before proceeding to the theme of my discussion relative to our experience in incentive contracts and our suggestion for needed changes, I would like to make two points.

First, many of the comments I will make would apply equally well to any of the other contract types.

Second, I believe that most of the changes needed are identified in the new DOD/NASA Incentive Contracting Guide.*

I would like to start by trying to clear up what I consider to be some of the most common misconceptions applying to incentive contracts; then to highlight a few of the key problem areas we have identified; and, finally, to discuss some of the major changes in the new guide.

The most common misconception is that the Government prefers certain contract types over others.

Effective pricing and sound procurement practices require discretion and judgment in selecting and negotiating the *right* contract type. While the procurement regulations state that the firm-fixed-price contract is the most preferred type for harnessing the profit motive because the contractor accepts full cost responsibility, this is not to say that the firm-fixed-price contract is always the right contract. As stated in the ASPR (Armed Services Procurement Regulation) Manual for Contract Pricing:

> **Sound procurement requires use of the right contract type. The best, most realistic and reasonable price in the world (for the particular requirement of hand) may turn sour if the contract type is wrong.**

This is especially true in the area of research and development contracting due to the nature of the work, the usual lack of definitive requirements, and the inability to measure technical objectives. The inability to measure risk frequently necessitates the negotiation of a cost-plus-award-fee or cost-plus-fixed-fee contract.

Factors contained in the ASPR Manual for Contracting Pricing, in the new DOD/NASA Incentive Contracting Guide and in the ASPR will go a long way toward correcting this misconception. Among these are:

- Emphasis placed upon the selection of the *right* contract type.
- Selection of contract type is a matter for negotiation between Government and industry.
- Contractors are encouraged to propose alternate contract types to that which is identified in the request for proposal.

In addition, there are the facts that there is now less use of cost-plus-fixed-fee contracts, and that the former use of quotas on such contracts is no longer a part of the cost reduction program.

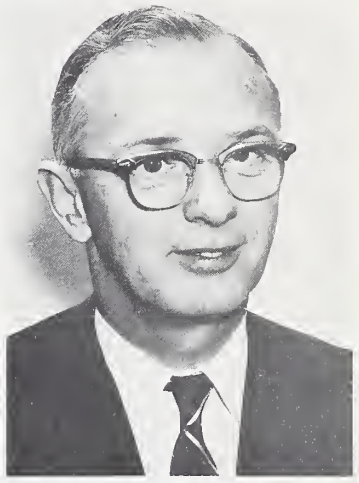
Another general misconception is the reason for the government's increased emphasis on incentive type contracts. The reason was *not*—and I repeat *not*—originally associated with the cost reduction program and the now famous 10-percent cost savings associated with incentive contracts. I believe that I can demonstrate this effectively by giving you two dates.

First, Revision No. 8 to the ASPR, which expressed the present emphasis for incentives, was issued in March 1962.

Second, the cost reduction directive was issued in February 1963–11 months later.

ASPR Revision No. 8 was issued as a result of a serious concern on the part of DOD management with the lack of management discipline, and the attendant loss of cost, schedule and performance control in the research, development and early production of major DOD weapon systems.

All too often, large-scale weapon system development, and even produc-



Robert D. Lyons has been Director for Procurement Management, Office of the Assistant Secretary of Defense (Installations and Logistics) since 1962. Previously, he held positions in procurement and production in Air Force Logistics Command. He also has worked in industry. He holds bachelor and masters degrees in business administration from Harvard University.

**Copies of the "DOD/NASA Incentive Contracting Guide" are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, at a cost of $2 each (Order No. 0–364–685).*

tion programs, had been undertaken before requirements were clearly defined, and before a clear determination had been made that the "technical building blocks" necessary to developing the system existed. Some examples to illustrate this point are:

- Nuclear-powered aircraft—Nearly 15 years and $1 billion were spent before the program was terminated.
- P6M jet-powered flying boat—$450 million were expended on a production contract, even though most of the technical problems had not been solved.
- SM–73 Goose missile.
- Sugar Grove, W. Va., radio telescope.
- Sky Bolt missile.

This lack of technical discipline was combined with the use of a series of contract types which provided no government contract control and no motivation to the contractors to balance costs with schedule and performance. In FY 1961, 47 percent of all contract dollars were on either cost-plus-fixed-fee or redeterminable contracts —the worst types, generally, in terms of the contractor assuming cost responsibility.

Recognizing the need for a variety of contractual forms, incentive contracts were proposed as a compromise arrangement between firm-fixed-price and cost-plus-fixed-fee, *i.e.*, the cost-plus-incentive-fee was proposed as a step above the cost-plus-fixed-fee and the fixed-price-incentive contract as a step below the firm-fixed-price contract. Most importantly, they bridged the gap between these two extremes. The Defense Department cannot purchase the wide range of products it requires having available only the firm-fixed-price contract on the one extreme and cost-plus-fixed-fee on the other.

What Is an Incentive Contract?

Probably our greatest problem in communication in the area results from a lack of agreement of what an incentive contract really is. For example:

- A Congressional committee has stated that the "firm-fixed-price contract is the incentive contract in its most pronounced form."
- The Honorable Carl Vinson once stated, "I know of no contract entered into by private enterprise that could not be considered an incentive contract."
- Former Secretary of Defense McNamara always referred to "fixed price and incentives" as though they were similar, if not the same.

Let me give you a few actual examples which will prove the extent of this problem of understanding:

- A cost-plus-incentive-fee contract with a 98/2 share ration—in other words, the Government pays 98 cents out of every dollar spent.
- A fixed-price-incentive contract with a 3/97 sharing ratio—the reverse.
- A cost-plus-incentive-fee contract with a 60/40 sharing ratio, a maximum fee of 7.1 percent and a minimum fee of 6.8 percent.
- A fixed-price-incentive contract with a 110-percent target price and a 109-percent ceiling price.
- A cost-plus-incentive-fee *term type* contract with a *ceiling*.

It is interesting to note that, notwithstanding certain negative comments we have received regarding the use of incentive contracts, every major study that has been conducted recommends their continued use. Two examples are:

- The Defense Science Board "agreed unanimously that incentive type contracting does not impede the attainment of technical objectives and that, in practice, especially in the research and development categories of engineering and operational systems development, it can be beneficially applied." The task group concluded "that priority areas for improvement are contract selection criteria and more refined appreciation of the proper circumstances of application rather than in basic changes to the system."
- The comprehensive Booz, Allen and Hamilton Report on major NASA contracts concluded that "the benefits and potential benefits of incentive contracting warrant the continued use of this technique for NASA research and development programs. . . . Incentive features aid in establishing the relative importance of specific elements of technical achievements within the overall performance objectives."

It should be noted that, to date, we have received more concrete examples of misapplication of firm-fixed-price contracts than we have on incentives.

The objective of DOD in the increased emphasis on incentive contracting, since 1962, has been an attempt to find a substitute for competition where it is limited or non-existent. This reflects the widely held belief within DOD that the cost-plus-fixed-fee contracts, commonly used up to that time for major weapon systems procurement, did not result in adequate control over costs. The goal of the incentive contract is to motivate the contractor to be efficient and *control his costs*, and the mechanism is a provision in the contract entitling the contractor *to retain a portion of any cost underrun as additional profits.*

Cost Control

It should be observed that cost control does not equate directly with an underrun of costs. In fact, one of the basic prerequisites for selection of an incentive contract is the presence of a degree of cost uncertainty which is recognized by both parties. It is for this reason that a range of probable costs is established, and the sharing provision applies to this entire range of possible outcomes.

If final actual costs consistently were identical to the originally negotiated target costs, it would strongly suggest that the wrong contract type had been selected. Such precision is not expected in this environment. If final costs were consistently below target (underrun), then there would be a basis for suspecting that the problem of overstated target costs is significant. Further, if the final incurred costs were consistently over target (overrun), then it could be reasonably concluded that the "buy-in, get well later" technique of winning the award could be suspected.

For this reason, the new guide tries to play down the use of the terms overrun and underrun by referring to them as variations from target. A cost underrun does not necessarily mean the contractor has exercised "good" cost control, nor does an overrun always result from "poor" cost control, especially if our definition of the range of incentive effectiveness as being the range of possible cost outcomes is correct. The guide, also, strongly recommends that as much attention be directed to evaluating and negotiating the upper and lower limits of the range of incentive effectiveness, as has occupied the negotia-

tion of target in the past.

Rewards and Penalties

This brings us to the second of our basic incentive contract objectives, *i.e.*, that while the contractor is to be rewarded for outstandingly effective and economical performance by high profit, he should, also, receive low profits or losses for poor performance. In this respect, at least, the incentive contract is superior to the cost-plus-fixed-fee contract which rewards the contract for oustanding performance, mediocre performance, or poor performance with the same *fixed fee*. It is significant that DOD has paid twice as many rewards for high performance under incentives as it has assessed penalties for below-par performance. The guide, therefore, introduces the concept that profit is used not only to motivate improved contractor performance or better cost control, but also to compensate the contractor in terms of profit for the value of the product to the Government.

One of the most significant new concepts expressed in the new guide goes to the area of contractor motivation. In the past, the concept has been that the contractor must achieve outstanding results in cost and performance in order to earn maximum fee. The guide now suggests that consideration should be given at times to allowing the contractor to earn maximum fee if he achieves maximum performance at target cost.

I believe in incentives, but we have learned that we must use many other existing tools in order to solve combined contractual and technical problems. None of the available techniques are mutually exclusive alternatives.

For several years, we have cautioned that contractual incentives alone cannot be relied upon to increase contractor efficiency. Other interrelated management techniques and disciplines must also be stressed.

Many years ago we learned that a good initial cost estimate, by itself, was not the only key to good incentive contracting. Often the key to good incentives is the preciseness of the statement of work or objectives. Our experiences have shown that it not only takes a good cost estimate, without over-optimism, to assure that an incentive can be effective, but that the cost estimate must be based on a good statement of work.

We need to continue the recent trend toward a pragmatic review of the application of incentives. The contract type must be appropriately applied in the context that there are many situations where a cost-plus-fixed-fee contract may be the appropriate choice, and there are many, many situations where the firm-fixed-price contract is the most appropriate. We probably oversold the drive against the indiscriminate use of cost-plus-fixed-fee contracts. Now, we are looking for optimistic realism in choice of contract type.

Our experiences have shown that we developed some incentive structures which were just too complex—they did not provide the visibility required for management or administration. We need to be innovative, but we do not need novelty or complexity. We need a contract that can accept changes, when necessary, and changes are often necessary; however, there is mounting opposition, even at the buyers' desks, to complexity, and I feel that our new computer visibility tools, introduced in the new guide, will assist us to avoid certain complexities which may make an incentive ineffective.

Our basic policies today are sound, the needed changes are found in the implementing instructions and procedures. Some of the written procedures have not kept pace with the evolving changes. We need to continually make improvements in communication of the changes to all buying levels. Primarily, the major change needed is to sell the requirement for a pragmatic look at each buying situation. We need to avoid an environment where standard operating guidelines become rigid standards for the purpose of measuring procurement efficiency.

Hopefully, the new DOD/NASA Incentive Contracting Guide will help to dispose of the misconceptions that contractors will always attempt to maximize profit; seek unreasonably high target costs; sacrifice short-term profit for extra contractual benefits; and make tradeoffs during performance which increase fee, regardless of the Government's objectives. It should also correct other misconceptions, such as those which say incentive contracts can be measured in terms of cost underruns or overruns; are designed to result in lower cost to the Government; and, if well structured, can assure program success.

U.S.-Soviet Military Balance—Its Impact on Air Force Planning and Management

Excerpt from address by General John C. Meyer, USAF, Vice Chief of Staff, U.S. Air Force, before the National Security Industrial Association, New York, N.Y., Nov. 20, 1969.

* * * * *

There is a growing recognition of the need for U.S. investment in up-to-date weapon systems as the expansion and refinement of Soviet military forces and equipment, and the chinks in our own armor, become more visible. If the trends of the last five years in U.S. and Soviet military development were to continue for long, balance in the two key elements of modern defense strategy would be transformed to our grave disadvantage. Those elements are:

Strategic nuclear forces of sufficient size, quality and flexibility to deter an attack on the United States, to discourage any other nation from either nuclear or conventional attack on our major allies, and to ensure our national interests against nuclear blackmail. This is a capability we have had for many years. I believe it to be essential so long as the freedom, independence and self-determination of nations are not adequately protected by international law. No other free world nation can provide this protective shield.

The ability to gain and maintain air superiority over any battlefield where U.S. forces may have to be committed. Without air superiority, neither air nor surface forces can operate effectively in most combat situations.

Retaining these two key capabilities sets the top priorities for Air Force planners and managers. The priorities are:

- Modernization of the bomber element of strategic offensive forces. A request for proposal on the B–1 went out to four contractors early this month. Competition will end May 18, 1970. We do not have approval to build the B–1. If we get subsequent approval for full-scale production, this aircraft can go operational probably in late 1977. The B–1 force that we hope to have will be smaller than the present bomber force, but as effective in the late 1970s as our present bomber force is today.
- If our strategic defensive forces are to carry their share of the deterrent load, we believe three things are needed: a new interceptor with greater speed, range and a look-down/shoot-down capability; AWACS for airborne warning and control; and over-the-horizon radar for improved warning. If funding for a new interceptor is not provided, we should, at the minimum, improve the F–106 with downward looking radar and a better air-to-air missile.
- Of parallel importance is the F–15 air superiority fighter. Source selection will take place next month. With an early go-ahead on full-scale production, we could have the first F–15s in operation by about 1975.

There are, of course, other systems and subsystems that are needed. One is the AX, an inexpensive attack aircraft to round out the close support team of F–4 and A–7 tactical aircraft. Another is better systems for locating and hitting small targets. In the air campaign of any future conventional war, we do not want to have to go back to a target several times with an armada of fighter-bombers, tankers, air superiority fighters and electronic countermeasures aircraft.

Continued work is essential on penetration aids for both missiles and aircraft, protective devices for ICBM sites, an advanced ballistic missile defense concept, and preliminary study and research on the next generation of weapons that ultimately will follow those that now are on the drawing boards.

Fundamental to the whole process is an active research and development program. This is another area where the Soviets are giving us a great deal of competition. Dr. John S. Foster Jr., Director of Defense Research and Engineering, has said that the Soviets' annual increase in research and development funding has been running about 10 percent, compared to a 4-percent annual growth in U.S. research and development. In our case, the increase is just about enough to offset inflation. Dr. Foster estimates that Soviet investment in research and development either has already exceeded ours, or is about to do so.

Greatest Challenge

Probably the greatest single management challenge in the process of force modernization and operation lies in weapon systems acquisition. It is necessary that we and industry meet cost estimates, performance specifications, and production schedules consistently.

In the past, there have been some very optimistic estimates of the cost of new weapon systems, both from the Air Force and from industry. The results of failure to meet an estimate can be extremely damaging. Cost estimates for a complex system to be produced several years in the future are subject to many variables, some of which neither industry nor the Air Force can control. I believe we can and must improve cost estimating, but I think it also is important that estimates be understood as *estimates*. That has not always been true and some of the fault lies with both the military and industry.

The Milestone Procurement Concept that will be used in the F–15 contract should help to assure more accurate estimates. This concept provides that a program will not go beyond a specified point until all accomplishments required for that contract milestone have been achieved. It ties continued development and release of production funds to a contractor's successful achievement of these well defined milestones.

The F–15 contract will have three major parts:

Part I covers design, redesign, and the operating cost of testing and will be negotiated on a cost-plus-incentive fee basis.

Part II is the test aircraft and hardware to support a flight test program.

Part III covers production of the first wing of aircraft, and training equipment.

The latter two parts will be written on a fixed price—incentive—successive targets basis. The possibility of upward revision of contract costs, based on accumulated experience, will be taken into consideration. A ceiling will be established beyond which costs will not be reimbursed. There is a need for flexibility, in both estimating and implementation, but there also is a need for greater realism than has sometimes existed in the past.

The early identification of technical risks, by both the Air Force and contractors, is important to both estimating and accomplishment. This has been carefully scrutinized in the case of the B–1. We have been working on major components of that system for the last five years. Technical risks have not always been assessed with a cold eye, and the results can be severe in cost increases.

Holding down the number of program changes is another goal, but one over which the Air Force sometimes

General John C. Meyer, USAF, is Vice Chief of Staff, U. S. Air Force. Prior to assuming this position, he was assigned to the organization of the Joint Chiefs of Staff, first as Deputy Director, then Vice Director of The Joint Staff, and in May 1967 became Director of Operations. From 1962 to 1966, he served as Deputy Director of Plans for the Strategic Air Command. General Meyer holds a B.A. degree from Dartmouth College, and is a graduate of the Air War College.

has had little control. Engineering changes are something else. Here I think our record will stand a close look. The degree of operational improvement that can be achieved by an unprogrammed engineering change, once production is under way, has to be balanced against the immediate cost and also the cost of a possible future retrofit. Sometimes the change is worth the cost. Often it is not and, occasionally, we have paid a lot to gain a little. A clear definition of operational objectives will help to reduce this kind of unprogrammed change.

Reduce Paperwork

Another goal is to reduce unnecessary paper work for the Air Force and the contractor. Some progress already has been made toward this goal. The request for proposal on the F–15 required far less paper work from industry than did the C–5 request for proposal.

We also would like to reduce the number of specialized management reports required from contractors. Very often the data we need is available in a different format from the contractor's internal management data system. Some contractors have not been aware that their data may be adapted to our requirements. In other cases, our informational needs have been tied to incompatible time intervals, and separate—apparently redundant—reports have been necessary. This appears to be an area where reduction of paperwork is practical.

I know many of you are familiar with the management procedures that have been set up for the F—15. We hope that it will be a breakthrough in improving weapon system acquisition. Supervision of the program has been decentralized to Air Force Systems Command. The Program Element Monitor is located in that command rather than in the Air Staff of the Department of the Air Force. The System Program Office at Wright-Patterson AFB has immediate responsibility for managing the program. Progress review has been streamlined to eliminate marginally productive layers between the Systems Program Office and the Air Force Secretary and Chief of Staff.

There are some bugs that will have to be worked out of this new decentralized and streamlined procedure. We expect that it will fix authority and accountability clearly and visibly, improve coordination, hold the number of developmental changes to a minimum, and speed up the periodic review process and the flow of key information to decision makers. It should also improve supervision of industry performance in the developmental and production stages.

The F–15 management method will be used for several other new weapon systems, but we do not regard it as a panacea. Management methods will vary according to technical risk, cost, and size of a particular program. In some cases, where a proposed system is not too complex and expensive—the AX could be one—prototype competition may be appropriate.

I think both industry and the Air Force have done better in weapon system development and production than some recent public discussion would lead one to believe. We have to do even better in the future. The increased threat, linked with tight budgets, demands it. Congress demands it. The public demands it.

The Air Force cannot meet its objective of economical and efficient modernization without the support of industry and, of course, the public. Unless we demonstrate unquestioned ability to plan and manage efficiently and clearly in the national interest, public support will be less than wholehearted. This is a challenge for both military and civilian planners and managers.

Navy Contracting Process for Aircraft Maintenance

Excerpt from address by Captain J. E. Harvey Jr., USN, Assistant Commander for Contracts, Naval Air Systems Command, at First Annual Navy Contract AeroSpace Services Symposium, National AeroSpace Services Association, Washington, D.C., Oct. 29, 1969.

[Editor's note: Film clips and slides were used in the delivery of this address. Information presented by visual aids has been included in the text.]

It is a distinct pleasure to meet with you in this the first Navy Contract AeroSpace Services Symposium. I trust this symposium will result in an improved understanding of our respective roles. It is to be hoped it will, also, result in an expanded industrial base upon which the Navy can rely for timely technical support of its needs. . . .

I think it is important to remember that the end objectives of contracting are to obtain required supplies or services on time and at a fair price in order to effect a military objective. We should not become so enamored of the contract terms and provisions that we forget the military objective. I also wish to emphasize that we are willing to pay a fair profit. . . .

The Naval Air Systems Command (NAVAIR) has responsibility for the

Captain J. E. Harvey Jr, USN, is Assistant Commander for Contracts in the Naval Air Systems Command. In previous assignments, he has served as Navy member on the Armed Services Procurement Regulation (ASPR) Committee; member of the planning group for the establishment of the Defense Supply Agency; and Deputy Commander for Purchasing in the Naval Supply Systems Command. Capt. Harvey holds a B.E. degree from Tulane University, an M.B.A. degree from Harvard University, and a J. D. degree from George Washington University.

development, production and support, which includes commercial contracting, for all air weapons for the Navy and the Marine Corps and, in some cases, for other Military Services and government agencies. . . . Aircraft maintenance and services are included. . . .

The contracts function commences with advanced planning for initial acquisition and extends through the production and support phases. In achieving the Navy objective of complete integrated logistic support for the total weapon system, our contracts necessarily reflect requirements for all logistics support elements such as supply provisioning, technical data, ground support equipment, operator and maintenance trainers, and training of fleet personnel.

* * * * *

There were 12 commercial aircraft maintenance contracts awarded in FY 1969 amounting to $18.8 million, covering work on 420 aircraft. In FY 1970, 11 contracts have been awarded amounting to $26.7 million, covering 407 aircraft. Representative aircraft included in both fiscal year programs are the C–118 transport, C–47/117 transport, T–34 trainer, and the P–2 patrol plane. An interesting addition to the FY 1970 program is the initial commercial contract for S–2 trackers. The dollar value for FY 1970 represents fixed prices for known work to be accomplished. This amount may be increased by as much as 30 percent to cover "over and above" effort included in the existing contract scope. I will speak later on the "over and above" work category.

* * * * *

Work Scope and Pricing Arrangement

First of all and most importantly, we attempt to obtain competition for aircraft rework programs, wherever feasible and practicable. I think this is borne out by the fact that 10 out of 12 of our aircraft commercial rework programs are contracted for on a negotiated competitive basis. We maintain a Source List. Every firm on the list is solicited for each competitive procurement. . . . Several of our procurements have resulted in set-asides for small business and labor surplus areas.

In general, our aircraft rework contracts are structured on the basis of the line items shown in Figure 1.

Structure of Aircraft Rework Contracts

Section A—Supplies or Services and Prices

Item	Supplies or Services
1	Services/Materials To Perform Model—Series Aircraft Progress Maintenance.
2	Services/Materials To Perform with Item 1, the Following Fixed-Price Work under this Contract: a. Accessory/Component Overhaul. b. Engine Changes. c. Post-Acceptance Aircraft Flight. d. Stripping/Resealing Fuel Tanks.
3	Services/Materials To Perform with Item 1, the Following Negotiable Work under this Contract: a. Aircraft Service Changes, Special Modifications and other Technical Directions. b. Correction of Extensive Corrosion. c. Repair of Major Damage. d. Emergency Repairs/Modifications of Aircraft on a "Drop In" Basis and On-site Crash Damage Repair. e. Packing, Preserving and Preparing Government-Furnished Materiel (GFM) for Shipment. f. Stripping/Painting Interior Surfacs. g. Normal Post-Acceptance Maintenance. h. Installation/Removal of Special/Unusual Equipment. i. Fabricate Parts from Bulk GFM, Repair GFM, and Make GFM Ready for Installation. j. Out-of-Frequency Work.

Figure 1.

Item 1 is work for which the scope, depth and frequency can be defined and which is required to be performed on each aircraft inducted for rework. This would include receipt of aircraft, disassembly, inspection procedures, certain repair and overhaul, reassembly, flight testing, etc. A firm fixed unit price is established in the contract for this work.

Item 2 is work for which the scope and depth can be defined but the frequency, *i.e.*, the number of times the work would need to be accomplished, cannot be predetermined. Examples of this work include engine changes, component overhaul, post-acceptance flights, stripping and resealing of fuel tanks, etc. A firm fixed unit price is also established for this work but the contractor cannot proceed until the work is ordered by the administrative contracting officer (ACO). The contractor is responsible for requesting the ACO to place an order as soon as the need for the work becomes known. This is commonly referred to as fixed price "exclusion" or "over and above" work category, which I mentioned earlier.

Item 3 is work for which neither the scope, depth, nor frequency can accurately be defined in advance. Examples include correction of corrosion, repair of major damage, accomplishment of aircraft service changes or other technical directives not required by the rework specification, packaging of material to be returned to the Government, etc. A firm-fixed-composite-labor rate which includes direct and indirect labor, overhead and profit is established for this work prior to contract award. The actual price paid for the work is determined on the basis of negotiated labor hours at the composite rate plus material at cost. Negotiations are conducted by the ACO with the contractor. This work must be ordered by the ACO. Again, the contractor must request authority from the ACO to accomplish the work

as soon as the need becomes known. This is also referred to as negotiable "exclusion" or "over and above" work.

In addition to the pricing structure and the terms and conditions of the contract, our solicitations contain a section entitled, "Additional Solicitation, Instructions and Conditions." While this section is generally at the end of the document, it should not be overlooked since it contains very important and pertinent information. Notices of pre-proposal conferences, location of technical data, price evaluation factors, contractor responsibility standards, etc., are all included in this section.

Price Evaluation and Contractor Responsibility

Regarding price evaluation, we first consider the total price for the Item 1 firm-fixed price work, *i.e.*, the unit price for Item 1 work multiplied by the total quantity of aircraft scheduled for rework during the period of the basic contract. Second, for fixed price "exclusion" or "over and above" work, we multiply the fixed unit price by quantity factors established for evaluation purposes only. For example, if the quantity of aircraft scheduled for rework is 40 single-engine aircraft, the number of engine changes may be multiplied by a factor of 50 percent on the presumption that half of the engines will require changing. Third, for the negotiable "exclusion" or "over and above" work, we multiply the composite labor rate by the total number of hours estimated to accomplish "exclusion" or "over and above" work on all aircraft scheduled for rework during the basic contract period. Bear in mind that these factors are only best estimates for evaluation purposes, and are not to be construed as actual work effort which would be required under a contract.

Finally, the total evaluated price is based on the Items 1 and 2 fixed prices and the Item 3 labor rates, multiplied by the pre-established evaluation factors set forth in the request for proposal. This total evaluated price is the basis on which prospective contractors are considered for award starting with the lowest acceptable proposal. We may negotiate with all those firms within a competitive range, price and other factors considered. However, each proposal should be submitted on the most favorable terms which the contractor can submit to the Government, since the Government may award a contract based on initial offers received without discussion or negotiations of such offers.

Regarding contractor responsibility standards, we generally conduct pre-award surveys to determine a prospective contractor's capability to perform in accordance with the requirements of the proposed contract. However, if information is readily available regarding a prospective contractor's capability to perform, award may be made without an on-site survey. We also use available historical cost, rates and other information to assist our reviews. Upon award of a contract, all unsuccessful offerors are notified of the number of contractors solicited, number of proposals received, name and address of the successful contractor, and award price.

Improved Methods Benefit Contractor, Government

We believe that our present contracts represent a significant improvement in contract methods for aircraft rework over those of prior years.

For example, approximately two or three years ago our Item 1 price included all component overhaul. There was no "exclusion" or "over and above" item for component overhaul. While the scope and depth of component overhaul could be defined, the frequency, *i.e.*, the number of times a component would require overhaul during the life of a contract, could not readily be determined. Some aircraft have up to 300 components and this presented an undesirable situation. From the contractor's point of view, a low estimate on the frequency of component overhaul could result in the contractor being put into a loss or low-profit position if actual component overhaul far exceed his original estimate on which he based his Item 1 price. On the other hand, if all contractors estimated too high for the frequency of component overhaul, the Government could be placed in a position of paying for work which would never be accomplished.

In order to eliminate this situation, we now price component overhaul as a fixed price "exclusion" or "over and above" item in the contract. Each time a component is required to be overhauled, the ACO will issue an order to the contractor at the fixed price stated in the contract. While additional administrative effort is required for this procedure, we feel it represents the most fair and reasonable approach to contracting for component overhaul, and also puts the evaluation of prospective contractors' proposals on a more equitable basis.

Significant improvements have also been made in the aircraft input schedules and "turn-around" times. In the past, the first month's input often was nearly as high as, or equal to, any other month's input and the turn-around time did not provide for a learning process. Our recent contracts and solicitations, where fleet requirements permit, provide for an input schedule of only one or two aircraft the first month and allowance is made for greater turn-around time for the first several aircraft inducted. This improvement went into effect in the current fiscal year.

Government-furnished material (GFM) is another area in which we feel we have made improvements. Under a recently adopted Single Supply Support Control Point (SSSCP) System, all material, with the exception of bulk-type materials such as greases and lubricants, are provided by the Government to the contractor for the performance of the contract. The SSSCP receives and processes all contract requirements for material, and serves as the single contact point on all supply matters for the contract. Also, the Naval Air Rework Facility at the designated SSSCP provides engineering and logistical services for support of the aircraft undergoing rework. Recognizing that GFM is often a problem, particularly when older out-of-production aircraft are involved, we feel the SSSCP System is a step in the right direction to provide GFM in a timely and economical manner.

As mentioned before, we maintain a Source List used in solicitation for each competitive procurement. I encourage those firms not on our list to make application and receive solicitations for our future aircraft rework requirements. To obtain information on appropriate procedure, you may contact: Naval Air Systems Command, Code 20122, Room 1641, Munitions Building, Washington, D.C. 20360.

Small Business Contribution to Security and Economy of the Nation

Excerpt from address by Lt. Gen. Harry E. Goldworthy, USAF, Dep. Chief of Staff, Systems and Logistics, Hq., U.S. Air Force, at the Business Opportunity/Federal Procurement Conference, Albuquerque, N. M., Nov. 13, 1969.

* * * * *

Small business has continuously flourished as a pillar of the American way of life. It has done so because, as a people, we have always believed—and still believe—that competition must prevail in the market place. Indeed, few Americans today would question the importance of small business in our way of life or the wisdom of helping to maintain and strengthen its influence in the economy.

Although it can be seen that throughout the history of our country the small businessman has played a major role, there are times when he is hard pressed. He neither has the resources of the larger corporation, nor does he have the market research and management controls that larger business generally has. On the other hand, his decision-making process is less cumbersome. A good, small firm can provide flexible and responsive engineering, low administrative costs, and first-rate products.

We have heard it said that every small business wishes to become big business. This, of course, is not always true and neither will nor should it happen across the board. A better statement might be that, with rare exceptions, every big business was once small.

The question often arises as to how our Government should treat small business in carrying out the policy of the Congress as expressed in the Small Business Act. The act reads, in part·

> **"It is the declared policy of the Congress that the government should aid, counsel, assist and protect, insofar as is possible, the interest of small business concerns in order to preserve free competitive enterprise, to insure that a fair proportion of the total purchases and contracts or subcontracts . . . be placed with small business enterprises." (15 USC 631, Sec 2a).**

The Federal Government follows policies that foster growth during the early—and sometimes critical—years in the life of a new business.

Small companies should know that there will be reasonable safeguards to protect them from unfair competition, and that they can prosper if they are creative and efficient.

In the event that a reduction of requirements makes necessary the termination—in whole or in part—of a contract, there must be a prompt and fair settlement with the contractor. This is equally true whether the contractor is doing business directly with the Government or performing as a subcontractor at any level.

This might be a good point at which to comment on observations I —in fact, probably all of us—have heard about doing business with small business.

We have all heard the remark, "It costs more to do business with small business concerns." This just is not so. Of course, there might be isolated instances one could cite, but they would be the exception.

While talking on this subject, let us get rid of another of the old wives' tales. This one is that small business gets favored treatment. Again, it is not so. If the words were changed to read "fair treatment," then I would say that is what we seek to do.

In general, it seems that small business problems fall into three areas of major need and concern:

- Obtaining a fair share of government procurement.
- Gaining access to adequate capital and credit.
- Obtaining competent management, technical and production counsel.

Let me hasten to say that large business shares some of these same problems.

Lieutenant General Harry E. Goldsworthy, USAF, is Deputy Chief of Staff (Systems and Logistics), Hq. U.S. Air Force. In his previous assignment he was Commander, Aeronautical Systems Division, Air Force Systems Command. He holds a bachelor of science in business administration from Washington State College. He is a graduate of the Army War College and the Industrial College of the Armed Forces.

Incidentally, if notice has been taken that I have not discussed large business, the omission has been intentional. It is not that large business does not play an important role as a supplier of government's requirements, for it, too, makes tremendous contributions to our defense posture. The fact is that most people here today are small businessmen.

"8a Contracts"

Consider for a moment an area of national concern—it has been called the problem of employment. There is no question but that socio-economic problems exist in this nation. The Government has launched programs to mobilize the resources of private industry and the Federal Government to help find jobs and to provide

training for thousands of America's hard core unemployed. The Defense Department is making positive contributions to the social needs of the country which, in turn, contribute to our national strength.

One area where we are helping is by awarding contracts to the Small Business Administration (SBA) under the provisions of Section 8(a) of the Small Business Act. The SBA, in turn, places these requirements on a preferential basis with companies that agree to hire and train the disadvantaged.

In making these awards, our purpose is to establish self-sustaining, competitive small businesses. A potential recipient of such an award, commonly called "8a contracts," will be required in the future to have a business plan approved by SBA. This plan will permit DOD to determine the extent of its commitments and the degree to which DOD contracts will assist in bringing the company to a competitive status and, thus, eliminate further use of "8a" contractual support at a discernible time.

I do not wish to appear redundant, but let me try to capsule some thoughts and observations. The Congress has made it abundantly clear that our resources must be used in every way possible to increase the contribution of small business to the general welfare. In economic terms, this is a command to help strengthen the competitive structure by helping small business offer America the highest quality and the greatest variety of goods and services at the lowest fair and reasonable price. In social terms, this is a mandate to preserve and strengthen the small business community as an outlet for imagination, initiative and individualism in America.

The concern to keep economic power distributed among many independent proprietors is one that goes back to the nation's beginning. It was a favorite theme of Benjamin Franklin and Thomas Jefferson who feared that industrialization might lead to a propertyless labor class.

Today, there is a continuing need to evaluate the place of small business in our economy, as well as the actions necessary to create and maintain an economic climate in which small business may be virile and significant.

* * * * *

Industrial Security Award Winners

The Defense Supply Agency presented James S. Cogswell awards to 28 companies for superior performance in carrying out security obligations on classified defense contracts in 1969.

Approximately 13,500 industrial firms having DOD security clearances were considered for the awards. Factors in selecting the winners included:

- Degree of security consciousness evidenced by management personnel of industrial organizations.
- Security education and motivation program by contractors for employees.
- Regular inspections by contractors of security practices within the organization.
- Security review procedures in company publications and advertising.
- Adaptation of new security methods in such areas as reproduction and transmission of documents, control of movement of employees and visitors within plants.

Two types of awards are presented: plaques for outstanding performance and certificates for excellence. Fourteen plaques and 24 certificates were awarded.

Plaques for outstanding performance were awarded to: **Honeywell, Inc.**, Minneapolis, Minn.; **General Dynamics, Pomona Division**, Pomona, Calif.; **Lockheed Electronics, Division of Lockheed Aircraft Corp.**, Watchung, N. J.; **Illinois Institute of Technology Research Institute**, Chicago, Ill.; **Western Union Telegraph Co.**, New York, N. Y.; **Varian Associates**, Palo Alto, Calif.; **Stanford Research Institute**, Menlo Park, Calif.; **HRB Singer, Inc.**, State College, Pa.; **Honeywell Inc.. Marine Systems Center**, Seattle, Wash.; **TRW Systems Group**, San Bernardino, Calif.; **Curtiss-Wright Corp., Electronics Division**, E. Paterson, N. J.; **Darsel Graphic Arts Services, Inc.**, Washington, D. C.; **KMS Industries**, Sherman Oaks, Calif.; and **Shock Hydrodynamics, Inc.**, Sherman Oaks, Calif.

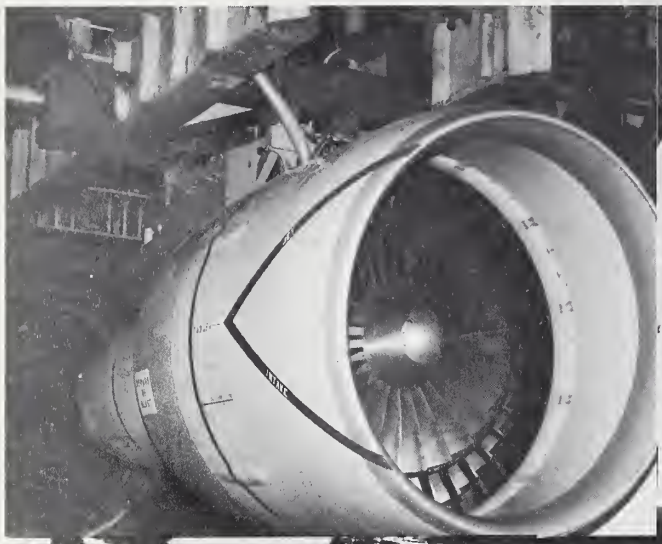
Companies selected to receive certificates of excellence were: **Bell Telephone Laboratories, Inc.**, Murray Hill, N. J.; **Day and Zimmerman, Inc., Lone Star Division**, Lone Star Army Ammunition Plant, Texarkana, Tex.; **Chamberlain Manufacturing Corp.**, Waterloo, Iowa; **Bendix Corp., Navigation and Control Division**, Teterboro, N. J.; **Martin Marietta Corp., Denver Division**, Denver, Colo.; **Radio Corporation of America, Astro Electronics Division**, Princeton, N. J.; **Federal Electric Corp.**, Paramus, N. J.; **Itek Corp.**, Lexington, Mass.; **ARO, Inc., Arnold AFS**, Tullahoma, Tenn.; **Singer-General Precision, Inc., Kearfott Group GPL Division**, Pleasantville, N. Y.; **EG&G, Inc.**, Santa Barbara Division, Goleta, Calif.; **ITT Electro-Physics Laboratories, Inc.**, Hyattsville, Md.; **North American Rockwell Corporation, West Virginia Plant**, Princeton, W. Va.; **Avco-Everett Research Laboratories**, Everett, Mass.; **The Boeing Co., Air Force Plant 77**, Hill AFB, Utah; **Midwest Research Institute**, Kansas City, Mo.; **KMS Industries, Inc., Litho Crafters Division**, Ann Arbor, Mich.; **Raytheon Co., Communications and Data Processing Operation**, Norwood, Mass.; **Union Carbide Corp., Materials Systems Division, Speedway Laboratories**, Indianapolis, Ind.; **Industrial Nucleonics Corp.**, Columbus, Ohio; **Photocopy Co., Inc.**, Santa Clara, Calif.; **Hayes International Corp.**, Albuquerque, N. M.; **Federal Electric Corp.**, Streator, Ill.; and **Western Union Telegraph Co.**, Belleville, Ill.

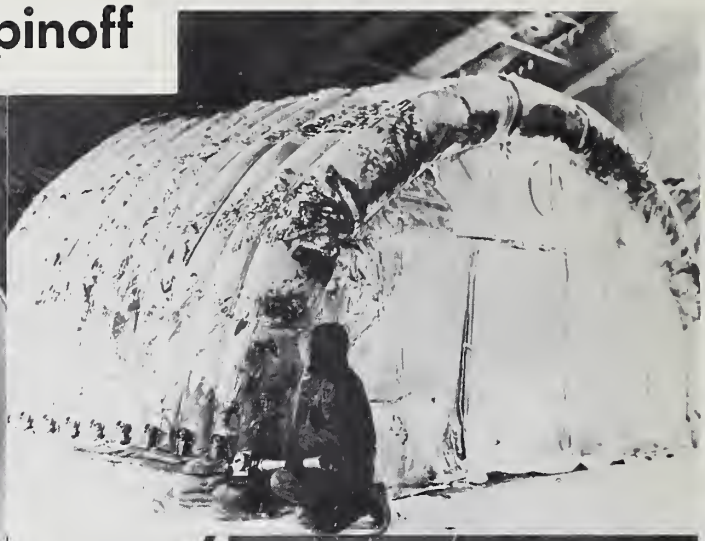
The annual award is named in honor of the late Colonel James S. Cogswell, USAF, first chief of a centralized office of industrial security, established in January 1965 under the Deputy Director for Contract Administration Services of the Defense Supply Agency.

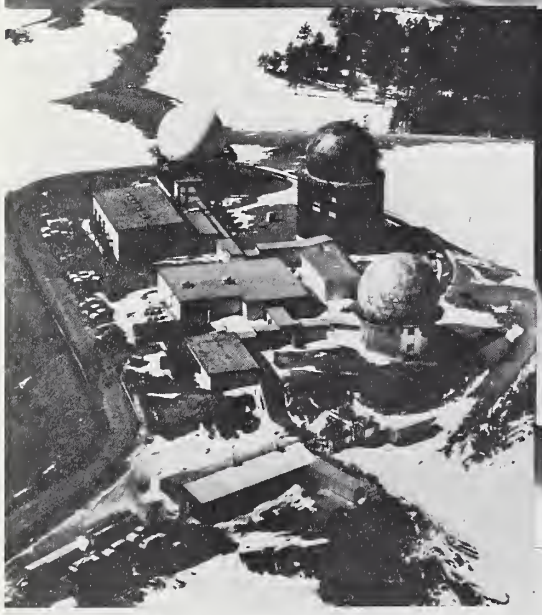
Navy Announces More Ship Retirements

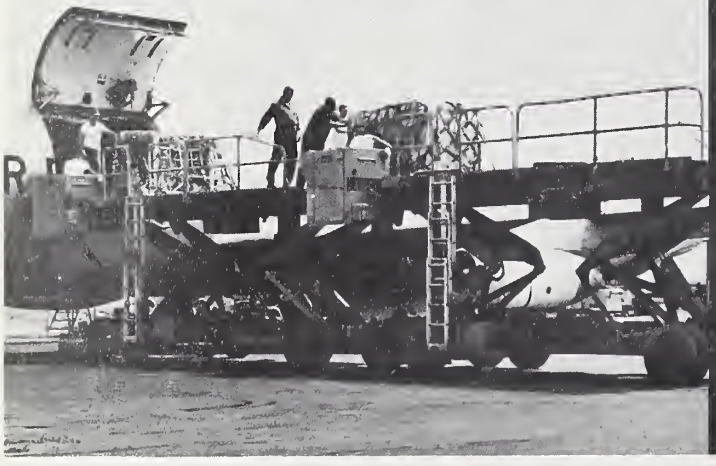
The Navy has announced the names of an additional eight destroyers and two aviation units to be retired as part of the Defense Department's economy program begun last August. The new retirements bring the total ship decommissionings to 111 and total aviation unit retirements to 13 during FY 1970.

U.S. Air Force Scientific Spinoff









[Editor's Note: The following is a reprint of a pamphlet developed by the Air Force Office of Information.]

Through the ages man has depended upon his inventive talents. He progressively developed the stone wheel into the rubber tire, and the maze of controls and instruments required for man's first moon landing vehicle. Byproducts also have played an important part in man's progress.

From crude oil came the kerosene for lamps during the Victorian era. It was later refined into gasoline to power the horseless carriage. Leftover tars were developed into medicines, plastics, and synthetic wash-and-wear fabrics.

Even the search for new systems for defending our country, or for investigating the mysteries of space, produced scientific advances for mankind. In the Air Force, major research and development is directed toward scientific advances required for military applications.

Aircraft have developed in the same manner. Starting with the X–1, X–2 and X–3, the Air Force applied the knowledge gained from these projects to the fighters and interceptors developed for our operational forces. Then came the X–15, XB–70, YF–12A and SR–71, incorporating the knowledge gained from each. Today, scientists are poring over the tons of data from the Air Force's experimental aircraft to find answers for the supersonic transport (SST).

It would be difficult to estimate the vast sum of money saved through this stepping stone procedure. It would be even more difficult to evaluate or pinpoint all of the benefits and specific items used in industry, commercial aviation, medicine, or in the home, that began in an Air Force laboratory or in the development of an Air Force system. However, all of these benefits represent scientific progress contributed by the Air Force to the nation's economy, safety, health, and standard of living.

Top left: TF–39 jet turbo-fan engine for C–5 cargo aircraft mounted on test pad. Turbo-fan engines have increased the economy of operation of civilian aircraft.

Top right: Air inflatable shelter undergoing arctic climatic testing at Eglin AFB, Fla. Air inflated structures have many civilian applications.

Center left: Radar site at Sundance, Wyo. Geodesic radomes protect antennas from wind and snow. A geodesic roof now shields sports fans.

Center right: Communications research led to a laryngeal cancer detection method now being developed by the U.S. Public Health Service. Dr. Philip Lieberman, Air Force Cambridge Research Laboratories, uses a small computer to make an area analysis of vocal cord opening.

Bottom left: Cargo is rapidly unloaded using the 463–L Materiel Handling System. Civilian airlines have adopted similar automated cargo handling methods.

Bottom right: Control rods, which regulate the rate of nuclear fission, protrude from the reactor and shielding water at Sundance, Wyo., nuclear powered radar site. Nuclear power is rapidly becoming a civilian source of electricity.

Commercial Aviation

Commercial and military aviation have always had a wingtip-to-wingtip relationship. In the early days, many commercial aircraft were converted to bombers or military transports. The DC–3, known as the C–47 in the Air Force, is an outstanding early example. Even today, commercial aircraft have been purchased by the Air Force for current use and to save research and development costs. Examples include the T–39 Sabreliner and the O–2A Super Skymaster.

The jet airliner became a reality on the basis of development and production of the B–47 and B–52 strategic bombers and the KC–135 Stratotanker aircraft. The XB–70 was never used operationally by the Air Force, but it was flown many hundreds of hours as a flying laboratory for the Air Force, the National Aeronautics and Space Administration (NASA), and the supersonic transport program.

Jet airliners became economical and practical only after the development of Air Force jet engines, jet fuels, and lubricants which resulted in increased engine life. Fuel consumption rates were also reduced, so the costs became competitive with propeller-driven aircraft. Another Air Force advancement that found its way into the commercial airline inventory was the turbo-fan engine that was developed for the B–52H bomber and the C–141 jet transport. In addition, Air Force fuel and lubricant programs provided the industry with techniques and manufacturing standards to produce these items in quantity, with the proper quality control to meet the demands of the commercial airlines.

A descendant of one of the Air Force's most sophisticated aircraft inertial guidance systems will be used on the new Boeing 747 jetliner. This provides greater flight accuracy at the high altitudes and speeds at which the world's largest jet airliner operates. Also, large jetliners would require longer landing distances if it were not for the turbine engine thrust reverser and beryllium brake linings developed by the Air Force.

The IFF (Identification—Friend or Foe) electronic equipment, developed for the Air Force to identify aircraft from the ground in combat situations, is being used by air traffic control installations to quickly spot specific aircraft in commercial airlanes. Another Air Force device, used by air traffic control monitors, is a high-power klystron radio frequency (RF) generator which improves air traffic separation.

Commercial aircraft builders are making increasing use of titanium, one of the strongest lightweight materials available for super jetliners. The Air Force was instrumental in developing materials and manufacturing techniques required for aircraft construction.

The airlines are following the Air Force in improving freight-handling efficiency through the automated techniques developed for the 463L Material Handling System. These techniques include both the computer control procedures and the standard pallet and motorized moving equipment used by the Air Force.

In addition, thousands of special seals, valves, fuel components, electronic hardware, and other aircraft parts have been developed by Air Force programs, and are now standard items for commercial aircraft manufacturers.

Agricultural, Industrial and Manufacturing

Effects of Air Force research and development projects have left their impact on virtually every phase of the country's productive economy.

One of these projects, the klystron-powered linear accelerator, is a device for imparting large kinetic energy to charged particles, such as electrons or protons. In the plastics industry, this accelerator is used for the cross-polymerization of plastics to produce better products for home and industrial use. The food industry employs this equipment for large-scale food sterilization and food preservation processes, and metal casting producers use it to detect imperfections in production.

High-resolution radar, developed and improved by the Air Force for bombing, navigation, and intelligence missions, is now being used for oil deposit search missions. Agricultural interests are depending on the same equipment to conduct crop and soil surveys. In geology, the high-resolution radar was used to determine various earthquake faults for scientific studies and possible earthquake prediction forecasts.

To provide a special reinforced plastic rocket case, Air Force engineers depended on a filament-winding process resembling the criss-cross pattern found on a spool of darning yarn. Industrial liquid processors have been constructing storage tanks and railway tank cars using this technique to produce lightweight and noncorrosive containers.

Like most scientists, Air Force research and development engineers have experimented widely with peaceful applications for nuclear energy. The Air Force's nuclear power plant at Sundance, Wyo., established many records for endurance and minimum nuclear fuel requirements. Many electrical producers throughout the country are converting to nuclear power as an electrical source which is more efficient and causes no further disfigurement of our natural resources.

Another benefit for many may result from a new, quick-hardening cement developed by the Air Force to repair rocket- or shell-damaged runways in Southeast Asia. A commercial firm is experimenting with this material in Dallas, Tex., as a speedy technique to repair potholes and other road and highway defects.

Infrared sensors that are used by the Air Force for air intelligence surveys and scientific studies have been adapted by the steel industry to control the thickness of rolled steel.

Commercial Applications

Many of the products or ideas that began in Air Force research and development laboratories are most apparent when they appear on the commercial scene.

The air-inflatable radome principle, used to protect radar equipment from the elements, has had many civilian applications. Giant balloon-like tents, which retain their shape under low air pressure even when punctured, are used for swimming pool covers, tents, temporary housing structures, and as forms for sprayed concrete buildings.

The rigid geodesic radome, a more permanent structure based on an unusual geometric pattern of plastic or fibreglass panels, has been used in various buildings throughout the world. One of the most familiar examples is the gigantic Astrodome in Houston, Tex.

Electronic detection sensors used by the Air Force to protect strategic bomber and missile bases from unauthorized visitors have been adapted for industrial and commercial burglar alarms. There are no wires or other power sources that can be cut off, and the detection devices cannot be seen by an intruder.

Another similar device is the magnetic detector. Its commercial applications include determining if an individual is carrying firearms, and preventing pilfering.

The infrared sensors used by the Air Force for night aerial photoggraphy and other scientific work have been converted by mine safety personnel to detect coal mine fires. They also are used for leak detection in gas lines.

The Air Force also has an airborne infrared terrain reconnaissance sensor which has been adapted for fire spotting by the U.S. Forestry Service.

A major Air Force contribution has been in the development of integrated circuits. These electronic devices, each doing the work of as many as 70 conventional components, have made possible the sophisticated third-generation computers being used or developed today, besides improved radio, television, hearing aids, and other electronic equipment.

The electronic computer, now deeply imbedded in almost every aspect of civilian life, owes much of its development to pioneering use by the Air Force in air defense systems. Transmission of digital data to computers over commercial communication lines was proven possible in these systems. The Air Force continues at the forefront of computer technology as the largest user of electronic data processing equipment in the world.

Medical Aids

The cumulative effect of various Air Force research and development programs includes contributions to medical science. Unlike the majority of military equipment, medical techniques and tools are used for the same purpose in civilian hospitals as in military medical facilities.

Air Force aeromedical research centers developed electron beam microprobe analysis, which is being used for advanced biological tissue examination and diagnosis.

The laser, which is finding more scientific applications each day, is being used by doctors for distended eye retina surgery.

Sensor devices used to monitor pilot heartbeat, respiration, and other body functions during the X–1, X–2 and X–15 flights, and during early space environment experiments, have also been applied in the civilian medical world. These biosensors allow a nurse or doctor to monitor several patients at a central station, providing a constant observation and warning system. Another advanced version of this technique allows a doctor, working in his office, to check a patient at his home, by means of a special sensor connected to the invalid's telephone circuit.

Many electrical and mechanical components required for artificial heart and kidney machines were made possible by Air Force equipment development projects. These projects included miniaturization of many parts to reduce the machines to practical sizes.

Communications and Electronics

Troposcatter communications, which increases the range of a radio signal by bouncing it off the troposphere, was developed by the Air Force in 1955. This technique has been adopted commercially and is being used as a communications link in the Persian Gulf, and by several oil companies for voice links over vast distances.

Portable color television cameras were made possible by integrated circuits, miniature components, and module construction techniques. Other contributing factors include the lightweight metals developed for aircraft, missiles, and various space projects.

The solar cell that turns sunlight into electrical energy is another innovation with commercial application. The emergency telephone system along the Los Angeles Freeway uses solar cells as a power source.

Consumer Products

Air Force development dividends also are reflected on a broader scale by products that would be recognized by the average consumer. A typical retail item is an electric wristwatch powered by a tiny nickel-cadmium battery developed for Air Force use.

A razor blade that advertises its special cutting edge owes its success to a thin film sputtering technique developed as a metal processing refinement by the Air Force.

Many advances used in producing long-lasting emergency flares for hunters and private pilots are based on Air Force-developed technology.

In other safety areas, the Air Force has long advocated seat belts for automobiles and has worked with several universities and foundations in developing automobile safety standards. Much of this work has been conducted on rocket sled tracks to determine the effects of high-speed crashes on dummies and automobiles.

Another Air Force-related item adopted by the automotive world is the radio antenna installed in the windshield, a technique used for years in cockpit canopies.

Materials developed for specific Air Force applications have found their way to the retail buyer in various other forms. The highly heat-resistant, compressed carbon lining developed for rocket propulsion fuel cases can now be purchased in most stores as a man's smoking pipe that is supposedly cooler smoking and longer lasting than natural briar.

For vacation use, products born in Air Force laboratories include silicone-impregnated plastics, light in weight and almost as strong as steel, which provide containers for clothes and overnight bags. They also are suitable for the colorful, unsinkable boats used for fishing or pleasure. Vacation items also include the transistor radio and sunglasses that become more opaque as the sun becomes brighter. These glasses were originally developed for aircraft pilots and crews exposed to sudden nuclear flashes.

Even at home the Air Force has had an influence on daily living. Super alloy yarns, developed for high-speed parachutes and space clothing, are now used in modern carpeting, drapes, and moothproof, stain-proof, fire-resistant clothing.

Solid-state, plug-in modular television components, now available commercially, are based on electronic construction concepts and techniques developed by the Air Force years ago.

During World War II, frozen dinners which could be heated rapidly were developed for B–29 Superfortress bomber crews. Further developed for aeromedical requirements, they were later modified by commercial food firms to become the "TV" dinner —a household item for the American family.

A modern cookware made from a white ceramic that does not burn, change color, or crack under sudden temperature changes uses the same material developed for the ablative, heat-resistant nose cone of an Air Force intercontinental ballistic missile. An Air Force material laboratory developed a cloth-like paper that is used as the filter for one of the new coffee makers found in many American kitchens.

Although military research and development projects are normally undertaken for national security purposes, many times man's individual safety, comfort and convenience are also served. In this way, both the American people and the Air Force are rewarded.

CDC Establishes STANO Division

The Army Combat Developments Command (CDC) has established a new division at its Fort Belvoir, Va., headquarters to oversee programs related to surveillance, target acquisition and night operations (STANO).

Overall goal of the STANO program is to improve the Army's capability to find the enemy, and to operate at night. STANO is part of a total battle field information gathering system intended to provide the capability to find the enemy, and to provide adequate intelligence on which to base command decisions.

The objective of the STANO Division is to plan and monitor the introduction of STANO capabilities into the field Army. The major CDC activity conducting this effort is the STANO Studies Directorate, formerly organized as Task Force RIPOSTE.

The new division will serve as a point of contact for both intercommand coordination and Army staff command coordination. Lieutenant Colonel Leslie D. Carter Jr. has been named chief of the STANO Division.

C–5 Program Reduced, Air Force To Buy 81

The Air Force has announced that funding for the C–5 procurement program for FY 1970 will not go beyond 23 aircraft. The decision provides for a total program of 81 aircraft.

In a July 1969 report, the Air Force anticipated additional increases in the program to bring total costs for 120 aircraft to $5.1 billion. A subsequent detailed review of costs indicated that an additional $149 million would be required to complete the 120 aircraft program. The additional costs were attributed to inflation and production difficulties.

Budget restraints required the Air Force to re-examine the FY 1971 budget program requirements, resulting in the reduction from 120 to 81 aircraft of the program. Further analysis of the cost impact of the reduction is being conducted by the Air Force to determine possible overall changes in the current $5.1 billion program cost.

DEFENSE INDUSTRIAL PLANT EQUIPMENT CENTER

MEMPHIS, TENNESSEE 38102 **Phone (901) 743-3410**

Editor's Note: This chart replaces the chart which appeared in the November 1969 Defense Industry Bulletin, page 25. Since publication of the earlier chart, there have been organizational and personnel changes at the Center. Organization charts appearing in the bulletin are edited to reflect those elements which are of interest to industry representatives. Organizational elements not involved in the DoD-industry relationship are omitted because of space limitation.

Names and telephone numbers are as current as possible at press time.

COMMANDER
CAPTAIN HUGH D BYRO, SC, USN 501

EXECUTIVE DIRECTOR
HUGH R CARRINGTON 502

OFFICE OF PLANNING AND MANAGEMENT
F A MORRIM, JR, DIRECTOR 505

- PLANS, PROGRAMS AND ANALYSIS DIVISION
  P H Coons 535
- SYSTEMS, PROGRAMMING AND PROCEDURES DIVISION
  W C Wilson 533
- PROCUREMENT DIVISION
  E T Burns 516
- MANAGEMENT CONTROL DIVISION
  T H Tuttle 576
- MISSION EXPANSION PLANNING OFFICE
  W C Wilson 533

OFFICE OF COMPTROLLER
W R MILLER, COMPTROLLER 523

- FINANCIAL MANAGEMENT DIVISION
  M L Sikes 524
- PERFORMANCE ANALYSIS AND REPORTS DIVISION
  J T Lawrence 660

DIRECTORATE OF STORAGE AND MAINTENANCE
COL C M ANDERSON, USAF, DIRECTOR 623
C L MOORE, DEPUTY 624

- STORAGE AND MAINTENANCE OPERATIONS DIVISION
  S W Brown 557
- OSAIER SUPPORT DIVISION
  M J Billharz 567
- SHIPMENT CONTROL DIVISION
  E P Chisholm 584

DIRECTORATE OF SUPPLY OPERATIONS
W A WOLLARO, DIRECTOR 508
LT COL R D INGE, USAF, DEPUTY 509

- MANAGEMENT SUPPORT OFFICE
  B F Clark 553
- METALWORKING EQUIPMENT DIVISION
  M E Smullen 551
- ELECTRONIC AND GENERAL PLANT EQUIPMENT DIV.
  H H Harpel 529
- MILITARY SUPPORT DIVISION
  E L Prince 528

DIRECTORATE OF TECHNICAL OPERATIONS
W M PAYNE, DIRECTOR 661
LT COL H L BJORK, USA, DEPUTY 662

- ENGINEERING AND FIELD SERVICES DIVISION
  L W Goar 693
- EQUIPMENT IDENTIFICATION DIVISION
  R L Myers 689

TENANT ACTIVITY

PROPERTY DISPOSAL BRANCH
HEADQUARTERS AF CONTRACT MANAGEMENT DIVISION (AFSC)
LOS ANGELES, CALIFORNIA 90045

DEFENSE INDUSTRIAL PLANT EQUIPMENT FACILITIES

OPERATIONAL CONTROL	TECHNICAL DIRECTION
DEFENSE INDUSTRIAL PLANT EQUIPMENT FACILITY ATCHISON, KANSAS Fred B Jensen	OOTC TRACY, CALIFORNIA, STOCKTON ANNEX MAJ M K Gray OCSC COLUMBUS, OHIO LT COL R E Benson, USMC DOMP MECHANICSBURG, PENNA. Ray Stine

DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during the month of November 1969.

DEFENSE SUPPLY AGENCY

3—**Tennessee Overall Co.**, Tullahoma, Tenn. $1,080,023. 446,660 pairs of men's polyester/wool tropical trousers. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0818.

4—**OJUS Industries, Inc.**, Miami, Fla. $1,310,193. 167,300 rolls of barbed concertina tape. Defense Construction Supply Center, Columbus, Ohio. DSA 700-70-C-2552.

5—**Rolane Sportswear, Inc.**, New York, N.Y. $1,540,003. 107,758 men's cotton raincoats for the Air Force. Ridgely, Tenn., and Hickman, Ky. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0865.

7—**Kingspoint Manufacturing Co., Inc.**, Fayetteville, N.C. $3,978,951. 96,240 pairs of men's flying coveralls. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0890.

10—**MacLeod Co.**, Cincinnati, Ohio. $1,090,948. 70 truck-mounted water distributor tanks. Defense Construction Supply Center, Columbus, Ohio. DSA 700-70-C-8171.

14—**Pembroke, Inc.**, Egg Harbor City, N.J. $2,700,199. 85,004 men's Army wool gabardine overcoats, with removable liners. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0830.

—**Major Coat Co.**, Bridgeton, N.J. $2,543,101. 85,000 men's Army wool gabardine overcoats, with removable liners. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0829.

20—**Oscar Meyer Co., Inc.**, Madison, Wis. $1,038,053. 567,168 twenty ounce cans of prefried bacon. Defense Personnel Support Center, Philadelphia, Pa. DSA 130-70-C-E506.

21—**A.N. Ellis Hosiery Co.**, Philadelphia, Pa. $1,046,533. 1,821,320 pairs of men's socks. Statesville, Granite Falls, Burnsville and Burlington, N.C. DSA 100-70-C-1002.

—**Ellis Hosiery Mills, Inc.**, Hickory, N.C. $1,012,533. 1,800,000 pairs of men's socks. Granite Falls, N.C., and Winchester, Va. DSA 100-70-C-1001. Defense Personnel Support Center, Philadelphia, Pa.

24—**South Jersey Clothing Co.**, Minotola, N.J. $2,368,000. 128,000 men's polyester and wool Army coats. Minotola and Philadelphia, Pa. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0997.

—**M. Lowenstein and Son, Inc.**, New York, N.Y. $1,195,738. 742,712 white cotton bed sheets. Columbia and Lyman, S.C. Defense Personnel Support Center, Philadelphia, Pa. DSA 100-70-C-0988.

26—**Pittston Clinchfield Coal Sales Corp.**, New York, N.Y. $1,082,400. 132,000 tons of bituminous coal for the Army. Clinchfield, Va. Defense Fuel Supply Center, Alexandria, Va. DSA 600-70-D-0137.

CONTRACT LEGEND

Contract information is listed in the following sequence: Date—Company — Value — Material or Work to be Performed—Location of Work Performed (if other than company plant) — Contracting Agency—Contract Number.

DEPARTMENT OF THE ARMY

3—**Lockheed Aircraft Corp.**, Sunnyvale, Calif. $7,959,678 (contract modification). YO-3A aircraft. Army Aviation Systems Command, St. Louis, Mo. DA-AJ01-69-C-0059.

—**Wismer and Becker Contracting Engineers**, Sacramento, Calif. $5,998,590. Completion of power house and switchyard, Ozark Lock, Dam and Reservoir, Arkansas River. Army Engineer District, Little Rock, Ark. DA-CW03-70-C-0031.

—**Texas Instruments, Inc.**, Dallas, Tex. $3,171,100 (contract modification). Classified. Dallas and Sherman, Tex. Army Mobility Equipment Command, Fort Belvoir, Va. DA-AK02-69-C-0603.

—**Lockheed Aircraft Corp.**, Sunnyvale, Calif. $2,184,758. Design, fabrication, installation, supervision, checkout and operation of the experimental system for the Hudson Moon event. Sunnyvale, Seattle, Wash., and the Nevada Test Site, Nev. Defense Atomic Support Agency, Washington, D.C. DA-SA01-69-C-10026.

—RCA, Burlington, Mass. $1,141,350 (contract modification). TOW test program for the Land Combat Support System. Army Missile Command, Huntsville, Ala. DA-AH01-69-C-1437.

4—**Chrysler Motors Corp.**, Oak Park, Mich. $1,845,638 (contract modification). 1-ton cargo trucks. Warren, Mich. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-0106.

—**Olin Corp.**, East Alton, Ill. $1,322,047. Fin assemblies for M15 4-lb bombs. Marion, Ill. Edgewood Arsenal, Md. DA-AA15-70-C-0197.

5—**Brunswick Corp.**, Sugar Grove, Va. $1,514,501. XM74 66mm rockets. Edgewood Arsenal, Md. DA-AA15-70-C-0139.

—**M.C. Ricciardi Co.**, Alpha, N.J. $1,350,820. Fiber containers for 2.75 inch rocket assemblies. Army Ammuniton Procurement and Supply Agency, Joliet, Ill. DA-AA09-70-X-0181.

6—**Raytheon Co.**, Andover, Mass. $1,470,000. Rebuild accelerators for the Hawk missile system. Army Missile Command, Redstone Arsenal, Huntsville, Ala. DA-AH01-70-A-0002.

—**M. M. Sundt**, Tucson, Ariz. $1,280,524. Modification and inclosing of an environment shelter, missile launching facility service tower, Vandenberg Air Force Base, Calif. Army Engineer District, Los Angeles, Calif. DA-CA09-70-C-0039.

10—**FMC Corp.**, San Jose, Calif. $3,464,340. Chaparral guided missile carriers. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-1247.

—**Sun Battery Co., Inc.**, Santa Ana, Calif. $1,351,840. 112,000 dry charge batteries for vehicle application. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-2102.

—**Vitro Corp. of America**, Silver Spring, Md. $1,400,000. Program support engineering services for Project Mallard. Fort Monmouth, N.J., and Silver Spring. Army Electronics Command, Fort Monmouth, N.J. DA-AB07-70-C-0042.

12—The Army Ammunition Procurement and Supply Agency, Joliet, Ill., issued the following contract modifications:

Hercules, Inc., Wilmington, Del. $6,920,359. Propellants and explosives, and non-production and maintenance activities, Army Ammunition Plant, Radford, Va. DA-11-173-AMC-0037(A).

Olin Mathieson Chemical Corp., East Alton, Ill. $3,245,611. Propellants, and non-production and maintenance activities, Badger Army Ammunition Plant, Baraboo, Wis. DA-AA09-69-C-0014. $33,241,140. Propellants and ammunition components, and non-production and maintenance activities, Indiana Army Ammunition Plant, Charlestown, Ind. DA-AA09-69-C-0148.

Uniroyal, Inc., New York, N.Y. $1,618,872. TNT, and loading, assembling and packing various items, and plant maintenance, Army Ammunition Plant, Joliet, Ill. DA-11-179-AMC-00062(A).

Eastman Kodak Co., Kingsport, Tenn. $12,436,414. Explosives, and plant maintenance and non-production activities, Holston Army Ammunition Plant, Kingsport, Tenn. DA-11-AMC-00035(A).

—**Aluminum Co. of America**, Pittsburgh, Pa. $5,590,250. 2.75 inch rocket motor tubes. New Kensington, Pa. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0256.

—**Norris Industries**, Los Angeles, Calif. $3,878,750. 2.75 inch rocket motor tubes. Pico Rivera, Calif. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0244.

—**Pace Corp.**, Memphis, Tenn. $1,246,390. M49A1 surface flares. Memphis, and Camden, Ark. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0137.

—**General Motors Corp.**, Indianapolis, Ind. $827,717. Evaluation, redesign, fabrication and test of an automatic loader for the XM70 combat tank. Indianapolis, and Cleveland, Ohio. Army Tank Automotive Command, Warren, Mich. DA-20-113-AMC-08843(T).

14—**Hercules Engine, Inc.**, Canton, Ohio. $1,442,976 (contract modification). Engineering change orders, LD-465-1C multifuel engine, 2½-ton truck program. Army Tank Automotive Command, Warren, Mich. DA-AE06-68-C-0006.

—**Whittaker Corp.**, Saugus, Calif. $2,924,625. 2.75 inch rocket motor igniters, Mk 125, Mod 5. Saugus and Indio, Calif. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0259.

—**Global Associates**, Oakland, Calif. $1,776,762 (contract modification). Logistics support, Kwajalien Missile Range, Marshall Islands. Army Safeguard System Command, Huntsville, Ala. DA-HC60-70-C-0001.

—**General Motors Corp.**, Indianapolis, Ind. $7,268,000 (contract modification). M551 Sheridan vehicles. Cleveland, Ohio. Army Weapons Command, Rock Island, Ill. DA-11-199-AMC-00610(W).

—**Stevens Manufacturing Co.**, Evansburg, Pa. $3,400,135. 12-ton 4 wheel semi-trailers. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-1245.

—**Booz Allen Applied Research**, Bethesda, Md. $2,150,000. Engineering support for Project Mallard. Red Bank, N.J., and Bethesda. Procurement Division, Army Electronics Command, Fort Monmouth, N.J. DA-AB07-70-C-0078.

17—**Atlas Chemical Industries, Inc.**, Wilmington, Del. $4,356,159 (contract modification). TNT, and plant maintenance and non-production activities, Chattanooga, Tenn. Army Ammunition Procurment and Supply Agency, Joliet, Ill. DA-11-173-AMC-00531(A).

—**Colt's, Inc.**, Hartford, Conn. $1,234,901. M16A1 and M16 rifles. Army Weapons Command, Warren, Mich. DA-AF03-69-C-0021.

—**Hercules, Inc.**, Wilmington, Del. $1,087,502 (contract modification). Propellants and explosives, plant maintenance and non-production facilities, Lawrence, Kan. Army Ammunition Procurement and Supply Agency, Joliet, Ill. DA-11-173-AMC-00042(A).

—**Zenith Radio Corp.**, Chicago, Ill. $1,053,000. 2.75 inch rocket fuzes. Army Am-

munition Procurement and Supply Agency, Joliet, Ill. DA-AA09-70-C-0193.

18—**Ammann and Whitney**, New York, N.Y. $1,978,874 (contract modification). Architect engineer services in the development of design criteria for tactical structures, and weapon system contractor support for Perimeter Acquisition Radar (PAR) sites, Safeguard weapons system. Corps of Engineers, Huntsville, Ala. DA-CA01-68-C-0018.

—**Airport Machining Corp.**, Martin, Tenn. $1,100,000. Metal parts for 2.75 rocket warheads. Union City, Tenn. Army Ammunition Procurement and Supply Agency, Joliet, Ill. DA-AA09-70-C-0170.

—**Chamberlain Manufacturing Corp.**, Waterloo, Iowa. $1,018,000. Metal parts for 2.75 inch rocket warheads. Army Ammunition Procurement and Supply Agency, Joliet, Ill. DA-AA09-70-C-0171.

19—**Fruehauf Corp.**, Detroit, Mich. $1,875,020. M674 semi-trailers and components. Derphos, Ohio. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-1246.

—**Raytheon Co.**, Norwood, Mass. $1,666,535. CV1548/G transistorized tactical field units components. North Dighton, Mass. Army Electronics Command, Philadelphia, Pa. DA-36-039-AMC-04878(E).

20—**Philco-Ford Corp.**, Newport Beach, Calif. $16,178,000. Chaparall ground support equipment hardware. Anaheim, Calif. Army Missile Command, Redstone Arsenal, Huntsville, Ala. DA-AH01-70-C-0230.

21—The Army Ammunition Procurement and Supply Agency, Joliet, Ill., issued the following contracts for fiber containers:

Consolidated Box Co., Inc., Tampa, Fla. $5,600,300. DA-AA09-70-C-0201.

United Ammunition Container Corp., Philadelphia, Pa. $4,277,100. Atlanta, Tex. DA-AA09-70-C-0203.

Federal Container Corp., Memphis, Tenn. $1,943,100. DA-AA09-70-C-0202.

Paper Tubes, Inc., Buffalo, N.Y. $1,-723,110. DA-AA09-70-C-0204.

—**Continental Motors Corp.**, Mobile, Ala. $2,958,650. Remanufacture of LDS 465-1A engine assemblies for 5-ton trucks. Army Tank Automotive Command, Warren, Mich. DA-AE07-69-C-5296.

—**Hughes Tool Co.**, Culver City, Calif. $2,-760,000. Tear down, inspection and repair of crash damaged OH-6A helicopters. El Segundo, Calif. Army Aviation Systems Command, St. Louis, Mo. DA-AJ01-68-A-0017.

—**Ryan Stevedoring Co., Inc.**, Mobile, Ala. $1,191,334. Stevedoring and related terminal services, Pascagoula, Miss. Hq., Eastern Area, Military Traffic Management and Terminal Service, Brooklyn, N.Y. DA-HC21-70-D-0125.

24—**Rohm and Hass Co.**, Philadelphia, Pa. $1,700,000. Solid propulsion technology. Redstone Arsenal, Huntsville, Ala. Army Missile Command, Huntsville, Ala. DA-AH01-70-C-0152.

—**General Motors Corp.**, Anderson, Ind. $1,345,026. 52,045 twelve volt storage batteries, type 6TN. Anaheim, Calif. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-2431.

25—**Bell Aerospace Corp.**, Fort Worth, Tex. $1,200,000 (contract modification). Naval air maintenance trainer for AH-1J helicopters. Army Aviation Systems Command, St. Louis, Mo. DA-AJ01-68-C-1928.

26—The Army Ammunition Procurement and Supply Agency, Joliet, Ill., issued the following contracts:

Hercules, Inc., Wilmington, Del. $5,-849,315 (contract modification). Propellants and explosives. Army Ammunition plant, Radford, Va. DA-11-173-AMC-00037(A).

General Time Corp., LaSalle, Ill. $6,-590,282. MTSQ fuzes, M564. Peru, Ill. DA-AA09-70-C-0216.

McGraw Edison Corp., Bristol, Conn. $3,543,284. MTSQ fuzes, M564. DA-AA09-70-C-0217.

Hamilton Watch Co., Lancaster, Pa. $3,365,752. MTSQ fuzes, M564. DA-AA09-70-C-0218.

Chamberlain Manufacturing Corp., Elmhurst, Ill. $1,760,460. Metal parts for 105mm illuminating projectiles. Waterloo, Iowa. DA-AA09-70-C-0213.

—**General Electric Co.**, Burlington, Vt. $2,-319,314 (contract modification). Repair parts for XM35 armament weapon subsystem of the UH-1 helicopter. Army Procurement Agency, New York, N.Y. DA-AF03-69-C-0036.

—**Bell Helicopter Co.**, Fort Worth, Tex. $1,093,540. OH-58A helicopter transmission assemblies. Hurst, Tex. Army Aviation Systems Command, St. Louis, Mo. DA-AJ01-68-A-0118.

—**Stevens Manufacturing Co.**, Ebensburg, Pa. $1,583,846. Four wheel, low bed semi-trailers. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-1253.

—**Peter J. Sakes, Inc.**, Freehold, N.J. $1,-385,324. Pre-engineered commissary sales store building, including air conditioning, utilities and site work, Fort Monmouth, N.J. Army Engineer District, New York, N.Y. DA-CA51-70-C-0031.

28—**American Optical Co.**, Keene, N.H. $2,-388,206. Mk 24 Mod 1 target detecting devices for the Chaparral missile. Army Missile Command, Huntsville, Ala. DA-AH01-69-C-1904.

—The Army Ammunition Procurement and Supply Agency, Joliet, Ill., issued the following contracts:

Remington Arms Co., Inc., Bridgeport, Conn. $52,812,305 (contract modification). Loading, assembling and packing small arms ammunition. Lake City Army Ammunition Plant, Independence, Mo. DA-49-010-AMC-00003(A).

Hercules, Inc., Wilmington, Del. $19,-152,997 (contract modification). Rocket propellant. Sunflower Army Ammunition Plant, Lawrence, Kan. DA-11-173-AMC-00042(A).

Uniroyal, Inc., New York, N.Y. $20,-528,768 (contract modification). Explosives, and loading, assembling and packing ammunition. Army Ammunition Plant, Joliet, Ill. DA-11-173-AMC-00062(A).

Ravenna Arsenal, Inc., Ravenna, Ohio. $4,602,735 (contract modification). Loading, assembling and packing 155mm and 175mm projectiles and components. DA-AA09-70-C-0002.

M.C. Ricciardi Co., Alpha, N.J. $1,332,-818 (contract modification). M105A2 fiber containers. Washington, N.J. DA-AG11-6°-C-0218.

DVA Corp., Mt. Laurel, N.J. $4,592,-000. M125A1 booster metal parts. DA-AA09-70-C-0195.

Etowah Manufacturing Co., Inc., Gadsden, Ala. $4,662,400. M125A1 booster metal parts. DA-AA09-70-C-0196.

I.D. Precision Components, Jamaica, N.Y. $3,504,000. M125A1 booster metal parts. Gadsden, Ala. DA-AA09-70-C-0197.

Brads Machine Products, Inc., Gadsden, Ala. $2,432,000. M125A1 booster metal parts. DA-AA09-70-C-0198.

—**Whittaker Corp.**, Saugus, Calif. $1,812,-000. Assembling, loading and packing M505A3 fuzes. Frankford Arsenal, Philadelphia, Pa. DA-AA25-70-C-0294.

—**Atwood Vacuum Machine Co.**, Rockford, Ill. $1,078,056. M14A1 metallic link belt links for 20mm cartridges. Frankford Arsenal, Philadelphia, Pa. DA-AA25-70-C-0295.

—**Goodyear Tire and Rubber Co.**, Akron, Ohio. $4,363,749. T97E2 combat tank track shoe assemblies. St. Mary's, Ohio. Army Tank Automotive Command, Warren, Mich. DA-AE07-70-C-2489.

—**FMC Corp.**, San Jose, Calif. $1,987,836. M113A1 armored personnel carrier vehicles. Army Tank Automotive Command, Warren, Mich. DA-AE07-69-C-2600.

—**AMETEK Corp.**, Sheboygan, Wis. $1,-056,610. Stabilizer rods for 2.75 inch rocket motors. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0284.

—**Vibratronics Laboratories, Inc.**, Bloomingdale, N.J. $2,876,400. M4 electric blasting caps. Picatinny Arsenal, Dover, N.J. DA-AA21-70-C-0282.

—**Bell Aerospace Corp.**, Fort Worth, Tex. $2,592,980 (contract modification). UH-1H helicopters. Hurst, Tex. Army Aviation Systems Command, St. Louis, Mo. DA-AJ01-69-C-0028.

—**Control Data Corp.**, Minneapolis, Minn. $7,500,000. Classified electronic equipment. Army Electronics Command, Fort Monmouth, N.J.

—**Norris Industries, Inc.**, Los Angeles, Calif. $2,729,157. M148A1B1 105mm cartridge cases. Los Angeles Army Procurement Agency, Pasadena, Calif. DA-AG07-70-C-0347.

DEPARTMENT OF THE NAVY

3—**General Dynamics Corp.**, Groton, Conn. $3,052,200. Studies of fleet ballistic missiles. Naval Ship Systems Command, Washington, D.C. N00024-70-C-0228.

—**Newport News Shipbuilding and Dry Dock Co.**, Newport News, Va. $2,851,200 (contract modification). Preparation of contract design drawings and specifications for the SSN 688 class nuclear powered submarine. Naval Ship Systems Command, Washington, D.C. N00024-69-C-0275 PZ03.

—**General Instrument Corp.**, Hicksville, N.Y. $1,555,738. High reliability battlefield surveillance radar for the Marine Corps. Naval Electronic Systems Command, Washington, D.C. N00039-70-C-3502.

—**RCA**, Moorestown, N.J. $2,022,305. High reliability battlefield surveillance radar for the Marine Corps. Naval Electronic Systems Command, Washington, D.C. N00039-70-C-3501.

4—**Allen and O'Hara, Inc.**, Memphis, Tenn. $6,136,000. Construction of a 230 bed hospital, Naval Hospital, Memphis, Tenn. Naval Facilities Engineering Command, Washington, D.C. N62467-68-C-0310.

—**Hydrospace Research Corp.**, Rockville, Md. $1,119,521. Sonar array reliability and acoustic performance trials. Naval Ship Systems Command, Washington, D.C. N00024-70-C-1023.

6—**The Magnavox Co.**, Fort Wayne, Ind. $31,044,648 (contract modification). FY 1970 procurement of airborne ASW systems. Naval Air Systems Command, Washington, D.C. N00019-68-C-0497.

—**Lockheed Aircraft Corp.**, Burbank, Calif. $10,000,000 (contract modification). S-3A weapon system. Naval Air Systems Command, Washington, D.C. N00019-69-C-0385.

—**United Aircraft Corp.**, Windsor Locks, Conn. $1,347,440. P-3 aircraft propeller systems. Naval Air Systems Command, Washington, D.C. N0019-69-C-0607.

7—**Admiral Systems Corp.**, Chicago, Ill. $3,-680,990. AN/ARC-51 radio sets. Naval Aviation Supply Office, Philadelphia, Pa. N00383-70-C-0450.

—**Bendix Corp.**, Mishawaka, Ind. $1,158,894. Talos missile UHF telemetering and field conversion rework kits. Naval Ordnance Systems Command, Washington, D.C. N00017-69-C-4309.

10—**Raytheon Co.**, Lowell, Mass. $2,194,700. Modification kits for Sparrow III missiles. Naval Ships Parts Control Center, Mechanicsburg, Pa. N00104-67-A-0006.

—**McDonnell Douglas Corp.**, St. Louis, Mo. $1,355,094. Replacement parts for F-4J aircraft ejection seats. Naval Ships Parts Control Center, Mechanicsburg, Pa. N00383-69-A-0003.

—**Sperry Rand Corp.**, St. Paul, Minn. $1,-107,000. CP-901/ASQ-114 computers. Naval Air Systems Command, Washington, D.C. N00019-70-C-0110.

—**General Dynamics Corp.**, Pomona, Calif. $1,040,400 (contract modification). Standard ARM missile avionics for the Air Force and Navy. Naval Air Systems command, Washington, D.C. N00019-68-C-0074.

—**Hydrodyne Industries, Inc.**, Hauppage, N.Y. $3,020,550. 6,500 shedder seal track section kits for repair and overhaul of LVTP-5 amphibious vehicles. Hq. Marine Corps, Washington, D.C. M00150-70-C-0129.

—**Eagle-Picher Industries, Inc.**, Joplin, Mo. $2,711,348. BB-626/U batteries and other electronic items. Ho. Marine Corps, Washington, D.C. M00150-70-C-0113.

13—**General Dynamics Corp.**, Groton, Conn. $1,984,200. Advance planning, design and material procurement for the overhaul of the USS Sturgeon (SSN 637). Naval Ship Systems Command, Washington, D.C. N00024-70-C-0227.

14—**Treadwell Corp.**, New York, N.Y. $1,-

450,960. Refurbishment of oxygen generators for submarine use. Naval Shipyard, Portsmouth, N.H. N00102-70-C-0269.

17—**Singer-General Precision, Inc.,** Little Falls, N.J. $10,363,821. ASN-84 navigational systems for P-3 aircraft. Naval Aviation Supply Office, Philadelphia, Pa. N00383-68-A-3201-0202.

—**American Electronics Laboratories,** Colmar, Pa. $3,700,000. Classified electronic countermeasures equipment. Naval Ship Systems Command, Washington, D.C. N00024-70-C-1123.

—**Hazeltine Electronics Corp.,** Little Neck, N.Y. $3,474,684 (contract modification). Airborne interrogator sets. Naval Air Systems Command, Washington, D.C. N00019-69-C-0538.

—**Todd Shipyards Corp.,** San Pedro, Calif. $1,593,621. Overhaul of the repair ship USS Hector (AR 7). Supervisor of Shipbuilding, Conversion and Repair, 11th Naval District, San Diego, Calif. N62791-70-B-0020.

—**Litton Systems, Inc.,** Pascagoula, Miss. $229,279,890 (contract modification). Two additional multi-purpose amphibious warfare ships, and long lead time for two other ships. Naval Ship Systems Command, Washington, D.C. N00024-69-C-0283.

18—**Vitro Corp. of America,** Silver Spring, Md. $1,069,935. Submarine planning and engineering studies. Naval Ship Systems Command, Washington, D.C. N00024-70-C-0214.

19—**Goodyear Aerospace Corp.,** Akron, Ohio. $22,500,000. SUBROC (Mk 28 Mod 1) components. Naval Ordnance Systems Command, Washington, D.C. N00017-69-C-1439.

—**General Electric Co.,** Washington, D.C. $1,020,000. Polaris guidance system tactical engineering support. Pittsfield, Mass. Naval Strategic Systems Project Office, Washington, D.C. N00030-70-C-0067.

20—**General Time, Inc.,** Skokie, Ill. $1,214,-489. Rockeye II mechanical time fuzes, plus shipping and storage containers. Naval Air Systems Command, Washington, D.C. N00019-70-C-0141.

—**United Aircraft Corp.,** East Hartford, Conn. $2,858,445 (contract modification). J-52-P-8A engines, engineering data, special support equipment and publications. N00019-67-C-0182. $1,650,000 (contract modification). YTF-30-P-412 engines, publications and ground support equipment. N00019-69-C-0614. Naval Air Systems Command, Washington, D.C.

21—**Newport News Shipbuilding and Dry Dock Co.,** Newport News, Va. $5,000,000. Detail design of the SSN-688 class nuclear submarine. Naval Ship Systems Command, Washington, D.C. N00024-70-C-0238.

—**Sylvania Electric Products, Inc.,** Mountain View, Calif. $2,357,250. Classified electronic countermeasures equipment. Naval Ship Systems Command, Washington, D.C. N00024-70-C-1128.

24—**Metals Engineering Corp.,** Greenville, Tenn. $8,288,276. Mk 82 Mod 1 500 lb. bomb fin assemblies. Naval Ships Parts Control Center, Mechanicsburg, Pa. N00104-70-C-A038.

—**Poloron Products, Inc.,** New Rochelle, N.Y. $8,222,291. Mk 82 Mod 1 500 lb. bomb fin assemblies. Batesville, Miss. Naval Ships Parts Control Center, Mechanicsburg, Pa. N00104-70-C-A024.

—**RCA,** Camden, N.J. $3,324,891. Spare parts for P-3C aircraft AN/ARC-142 and -143 radio communications systems. Naval Aviation Supply Office, Philadelphia, Pa. N00383-70-C-1817.

—**Western Electric Co.,** New York, N.Y. $1,334,933. Oceanographic research. Whippany, N.J. Naval Electronic Systems Command, Washington, D.C. N00039-69-C-3523.

25—The Naval Purchasing Office, Los Angeles, Calif., issued the following contracts for classified work:

Hughes Aircraft Co., Culver City, Calif. $1,050,000. N00123-70-C-0863.

General Electric Co., Philadelphia, Pa. $1,050,000. N00123-70-C-0862.

26—**Bendix Corp.,** Teterboro, N.J. $2,301,325. A-4F and TA-4J aircraft automatic flight control system components. Teterboro, and North Hollywood, Calif. Naval Aviation Supply Office, Philadelphia, Pa. N00383-069-A-0004-0268.

—**Cameron Iron Works Inc.,** Houston, Tex. $2,238,951. Mk 12 Mod 1 inert guided missile boster and Mk 200 Mod 0 inert igniter assembly. Naval Ordnance Station, Indianhead, Md. N00174-70-C-0014.

—**Western Electric Co., Inc.,** New York, N.Y. $1,720,000. Mk 1 Mod 1 weapon direction equipment. Burlington, N.C. Naval Ordnance Systems Command, Washington, D.C. N00017-70-C-2304.

—**Sperry Rand Corp.,** Charlottesville, Va. $1,206,738. Ships navigational systems. Naval Ship Systems Command, Washington, D.C. N00024-70-C-5249.

28—**Newport News Shipbuilding and Dry Dock Co.,** Newport News, Va. $26,500,000 (contract modification). Continuation of engineering, procurement, planning and other procurement phases of the nuclear-powered aircraft carrier program. Naval Ship Systems Command, Washington, D.C. N00024-67-C-0325 P023.

—**McDonnell Douglas Corp.,** St. Louis, Mo. $13,500,000 (contract modification). Long lead time funding of F-4E/J and RF-4E aircraft. Naval Air Systems Command, Washington, D.C. N00019-68-C-0495.

—**Lockheed Missiles and Space Co.,** Sunnyvale, Calif. $12,894,000. Operational systems development program for the Poseidon missile. Naval Strategic Systems Project Office, Washington, D.C. N00030-66-C-0186.

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3—**TRW Inc.,** Redondo Beach, Calif. $5,750,-000. Computer program for Minuteman III. Space and Missile Systems Organization, AFSC, Los Angeles, Calif. F04701-70-C-0114.

—**American Electric Inc.,** Lamirada, Calif. $1,053,854. 750-pound bombs. Ogden Air Materiel Area, AFLC, Hill AFB, Utah. F42600-69-C-2205.

4—**National Lead Co.,** Toledo, Ohio. $2,-737,119. Munitions component parts. Toledo, Ohio, and Batavia, N.Y. Ogden Air Materiel Area, AFLC, Hill AFB, Utah. F42400-70-C-0661.

5—**Westinghouse Electric Corp.,** Baltimore, Md. $1,242,000. Test benches and aerospace ground equipment for F-4E aicraft radar systems. Cockeysville, Md. Ogden Air Materiel Area, AFLC, Hill AFB, Utah. F34601-69-A-0034.

—**Dynamics Corp. of America,** Long Island, N.Y. $1,192,693 (contract modification). Service and supplies for repair/modification and reconfiguration of mobile ground communication systems. Oklahoma City Air Materiel Area, AFLC, Okla. F34601-69-A-0345.

—**Honeywell, Inc.,** Arlington, Va. $1,133,-211. Purchase of installed leased computer systems. Wellesley Hills, Mass. 2750th Air Base Wing, Wright-Patterson AFB, Ohio. F33600-70-F-2235.

6—**Lockheed Aircraft Corp.,** Marietta, Ga. $7,853,358. Spare parts for C-5A aircraft. Detachment 31, San Antonio Air Materiel Area, AFLC, Marietta, Ga. AF 33657-15053.

7—**Sylvania Electric Products, Inc.,** Needham, Mass. $5,917,950. Operate, maintain and perform minor modification to the missile tracking radar system, Kwajalein atoll. Electronic Systems Division, AFSC, L.G. Hanscom Field, Mass. F33657-69-C-1214.

—**General Electric Co.,** West Lynn, Mass. $1,573,200. Aircraft engines. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33657-69-C-1214.

10—**Sylvania Electronic Systems, Inc.,** Waltham, Mass. $6,089,295. Production support of the Minuteman missile ground electronics system and related support items. Space and Missile Systems Organization, AFSC, Los Angeles, Calif. F04701-69-C-0236.

—**Space Corp.,** Dallas, Tex. $1,753,436. A/S 32H-6 trucks. Garland, Tex. Warner Robins Air Materiel Area, AFLC, Robins AFB, Ga. F09603-70-C-1211.

13—**General Dynamics Corp.,** Fort Worth, Tex. $66,850,000. F-111 aircraft. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. AF33(657)-13404.

—**Cornell Aeronautical Laboratory, Inc.,** Buffalo, N.Y. $1,135,000. Development, design and fabrication of a variable stability aircraft. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33615-67-C-1157.

17—**Sanders Associates, Inc.,** Nashua, N.H. $1,212,100. Electronic countermeasures equipment. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33657-69-C-1366.

—**Electronic Resources, Inc.,** Los Angeles, Calif. $1,004,160. Aircraft camera and electronic sensor controls. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33657-70-C-0316.

18—**Electro-Mechanical Corp.,** Sayre, Pa. $3,719,627. Transportable shelters for electrical equipment of Tactical Air Control systems. Electronic Systems Division, AFSC, L.G. Hanscom Field, Mass. F19628-70-C-0048.

19—**Philco-Ford Corp.,** Newport Beach, Calif. $3,630,000. Target designator equipment for F-4D aircraft. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33657-70-C-0345.

—**Martin-Marietta Corp.,** Denver, Colo. $2,-313,740. Design, development, fabrication and delivery of a Titan III space booster. Space and Missile Systems Organization, AFSC, Los Angeles, Calif. AF 04-695-150.

—**Airesearch Manufacturing Co.,** Los Angeles, Calif. $2,249,623. Electronic components for the F-4 aircraft. Torrance, Calif. Ogden Air Materiel Area, AFLC, Hill AFB, Utah. F42600-70-C-2877.

20—**LTV Electrosystems, Inc.,** Greenville, Tex. $2,228,507. Inspection and repair as necessary for maintenance, and wing modification of C-133 aircraft. Warner Robins Air Materiel Area, AFLC, Robins AFB, Ga. F09603-70-C-0739.

21—**General Electric Co.,** Philadelphia, Pa. $5,192,730. Research and development of the Mk 12 reentry vehicle. Space and Missile Systems Organization, AFSC, Los Angeles, Calif. AF04(694)-473.

—**Lockheed Aircraft Corp.,** Marietta, Ga. $2,221,878. Spare parts for C-5A aircraft. Detachment 31, San Antonio Air Materiel Area, Marietta, Ga. AF 33(657)-15053.

24—**The Hallicrafters Co.,** Rolling Meadows, Ill. $1,342,000. Spare parts for the AN/ALT-28 electronic countermeasure system for EB-66E aircraft. Warner Robins Air Materiel Area, AFLC, Robins AFB, Ga. F33657-69-A-0014.

—**Philco-Ford Corp.,** Palo Alto, Calif. $1,-200,000. Logistic support of the satellite control network. Air Force Satellite Control Facility, Los Angeles, Calif. F04701-68-C-0060.

26—**Hughes Aircraft Co.,** Fullerton, Calif. $4,-706,833. Engineering, production and test of Tactical Air Control Operations Centers. Electronic Systems Division, AFSC, L.G. Hanscom Field, Mass. F19628-67-C-0154.

—**Emerson Electric Co.,** St. Louis, Mo. $2,-210,207. F-111 aircraft test equipment spare parts. San Antonio Air Materiel Area, AFLC, Kelly AFB, Tex. F41608-68-C-8961.

28—**Motorola, Inc.,** Scottsdale, Ariz. $8,733,540. Bomb proximity fuzes. Armament Test Center, AFSC, Eglin AFB, Fla. F08635-70-C-0202.

—**Rohr Corp.,** Chula Vista, Calif. $1,466,300. C-141 aircraft components. Warner Robins Air Materiel Area, AFLC, Robins AFB, Ga. F09603-70-C-1250.

—**General Motors Corp.,** Indianapolis, Ind. $22,994,738. TF-41-A-1 and A-2 turbofan engines. Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio. F33657-67-0163.

—**Lockheed-Georgia Co.,** Marietta, Ga. $184,-135,100 (allotment of funds). 23 C-5A aircraft in the Run B option. Aeronautical Systems Division, AFSC, Wright Patterson AFB, Ohio. F33(657)-15053.

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Navy Plans NAVFAC Field Division Changes

The Naval Facilities Engineering Command, Washington, D.C., has announced plans to consolidate its 13 Engineering Field Divisions into 6 larger Field Divisions.

Need for consolidation was brought about by reductions in the FY 1970 budget supporting the divisions. Proposed consolidations include:

- Northeast Division, Boston, Mass., Eastern Division, New York, N.Y., and Midwest Division, Great Lakes, Ill., to the Northern Division, Philadelphia, Pa.
- Gulf Division, New Orleans, La., to the Southern Division, Charleston, S.C.
- Caribbean Division, San Juan, Puerto Rico, to the Atlantic Division, Norfolk, Va.
- Southwest Division, San Diego, Calif., and Northwest Division, Seattle, Wash., to the Western Division, San Francisco, Calif.

No changes were announced for the Pacific Division, Honolulu, Hawaii, and the Chesapeake Division, Washington, D.C.

USAF Enlists "Dynamic Dan" for Ejection Seat Tests

The Air Force has developed a mechanical analog—a model of the mechanical characteristics of the human body—to be used in testing ejection seats and other aircraft escape systems.

Known as "Dynamic Dan," the analog is being constructed for the Air Force System Command's Aerospace Medical Research Laboratory (AMRL), Wright-Patterson AFB, Ohio, by the Payne Division, Wyle Laboratories, Rockville, Md.

Researchers found that normal dummies, when used in ejection seat tests, did not react the same as the human body does; the dummies were rigid, where man is elastic. This elastic motion of the human body can result in adverse tumbling of the seat during ejection.

Dan, however, has a fiberglass skeleton with the same stiffness and weight as live human bones, and rubber flesh presenting the same resistance to deflections as human flesh. Researchers expect Dan to slump and deform the same as man does under the high forces encountered during ejection and separation from disabled aircraft.

Dan's body also represents the aerodynamic drag characteristics of the human body, making him a valuable tool in testing rocket ejection systems. Literally yanking the pilot from the cockpit by his parachute harness, the system has been man rated for use at speeds up to 250 knots; higher speed could be used if the system could be man rated, via reusable Dan.

Air Force researchers also see Dan as the progenitor of more realistic analogs. By incorporating injury fuses, wires, or other breakable elements within each segment of the body, the analog would "break" at the same point of stress a human body would break. The analog's segment would not be destroyed, however; it would only record whether the forces exerted on it were great enough to break the bone or organ represented, allowing reuse.

Project engineer is James W. Brinkley of the Biodynamics and Bionics Division of AMRL.

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